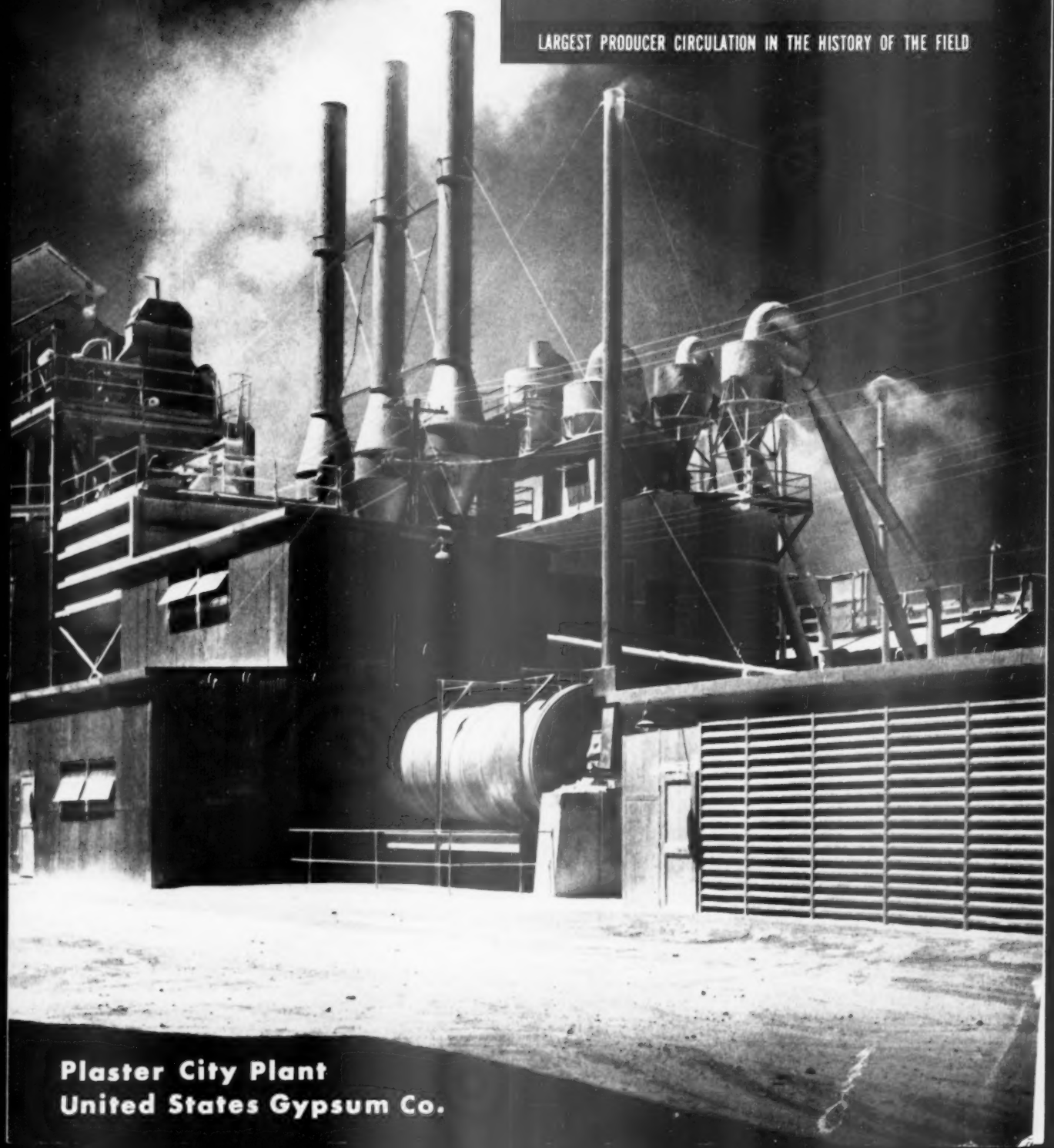
THE INDUSTRY'S RECOGNIZED AUTHORITY

FEBRUARY
1952

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD



Plaster City Plant
United States Gypsum Co.

"Let the shovel go . . . but hang on to that DIPPER"

When the preference for an Amsco Dipper is so strong that a superintendent at one of Minnesota's largest iron mines quietly removes it from a shovel being shipped to another mine, there are apt to be some good performance reasons why!

The superintendent reported that this AMSCO 6½ yard renewable lip dipper *loaded a record number of tons per 8 hour shift*—more than had ever been loaded before. And, where other dippers needed repairs every 2 months or so, it is still going strong after 6 months of service with no repairs of any kind!

Better design and construction are the reasons for this high production and longer, uninterrupted service. The wide mouth and shallow depth permit faster, easier digging and loading, and a 4-way taper insures clean dumping every time.

And, this dipper is *all-cast*—of tough, work-hardening AMSCO Manganese Steel. The renewable lip and heel plate, when finally worn, are replaceable in a matter of minutes.

Dippers can—and should be—bought with an eye to higher digging efficiency and lower costs per ton . . . and the moral of this actual on-the-job example is clear . . .

WHEREVER YOU MEET A PROBLEM OF WEAR CAUSED BY IMPACT AND/OR ABRASION . . .

. . . find out about longer-lasting, dollar-saving Manganese Steel Dippers made by AMSCO . . . world's largest producer of manganese steel castings for all industry.

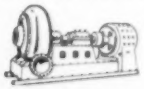
AMSCO controls impact and abrasive wear in 5 basic industrial operations:

Power Transmission

Mining and Excavating

Transportation

Crushing and Pulverizing



Materials Handling

Brake Shoe | **AMERICAN MANGANESE STEEL DIVISION**

377 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

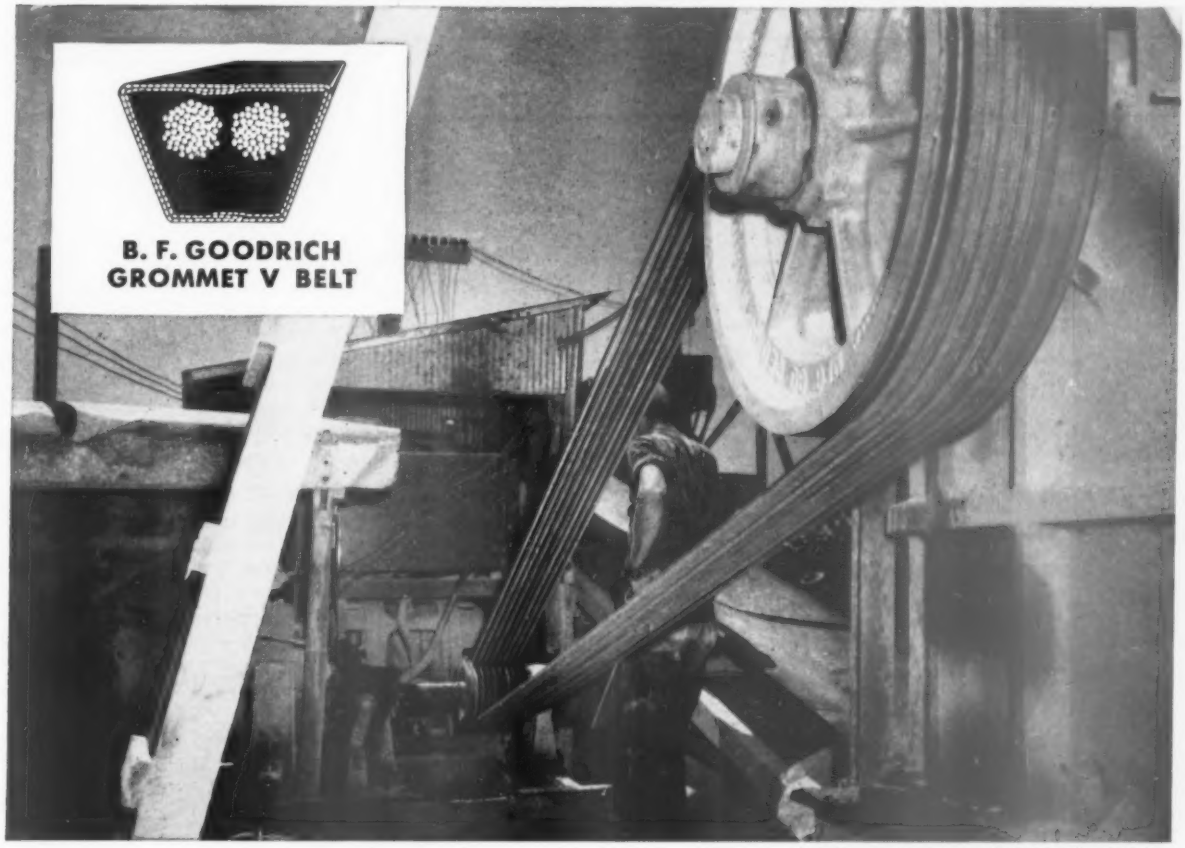


Photo courtesy of Valley Limestone & Gravel, Inc., Farmington, Iowa

Production increased 25 per cent with B.F.Goodrich grommet V belts

B. F. Goodrich often cuts belt costs 20 to 50 per cent

THESE belts drive a rock crusher 9 hours a day, six days a week. In addition to the long hours belts are exposed to dampness, oil and sharp grit. Still worse, the crusher abuses the drive with every impact of its jolting, grinding action. Previously, the operators had "tried everything" including flat belts, other V belts, even a chain drive. But mechanical trouble and production hold-ups continued.

The B. F. Goodrich grommet belts were tried at the suggestion of a BFG distributor's salesman. When the picture above was taken the grommet belts had been in operation almost 2 years. The grommet belts' record: production up 25%, large savings in labor and maintenance time, no belt replacement costs, better working conditions for men—less noise, greater safety. BFG grommet belts can be counted on to *save* because of:

No cord ends—A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength—All of the cord material in a B. F. Goodrich grommet multiple-V belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one other and generate heat; cord and adhesion failures are reduced.

Better grip, less slip—Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet!—No other multiple-V belt is a grommet V belt (U.S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Grommet V Belts BY
B.F.Goodrich
RUBBER FOR INDUSTRY

FEBRUARY, 1952

ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

VOL. 55, No. 2

Bror Nordberg
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Nathan C. Rockwood
Editorial Consultant

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ROCK PRODUCTS is published monthly by MACLEAN-HUNTER Publishing Corporation, 309 West Jackson Blvd., Chicago 6, Illinois; Horace T. Hunter, President; E. R. Gauley, Vice President; Ralph K. Davis, Secretary. Copyright, 1952. Entered as second-class matter, Jan. 30, 1936, at the Chicago, Ill. post office under the act of Mar. 3, 1879. Additional entry at Milwaukee, Wis.
ROCK PRODUCTS is indexed regularly by Engineering Index, Inc. and the Industrial Arts Index.

SUBSCRIPTION INFORMATION

Subscription Price: United States and Possessions, Canada one year, $2.00; two years, $3.00; three years, $4.00. Pan American, one year, $4.00; two years, $7.00; three years, $10.00. All other foreign, one year, $6.00; two years, $12.00; three years, $15.00. Twenty-five cents for single copies. Canadian subscriptions and remittances may be sent in Canadian funds to ROCK PRODUCTS, P. O. Box 100, Terminal "A," Toronto, Canada.
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TL-1530 Trailer with EUCLID

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EASTON SIDE-DUMPS

B-1050

Only the Timken Company offers all 3 rock bit types...

and a complete rock bit engineering service!

IF you want to get the best bit for your particular job, go to the Timken Company—the only manufacturer who makes *all three* types of rock bits:

1 **MULTI-USE.** Gives lowest cost per foot of hole when full increments of drill steel can be drilled and when control and reconditioning of bits are correct.

2 **CARBIDE INSERT.** For drilling extremely hard and abrasive ground, smaller holes, extra deep holes. Holes go down faster, bit reconditioning is minimized.

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... your best bet for the best bit... for every job

THIS SHOVEL HAS STOOD the Rock Test!

Here's the kind of a job that tests the metal of equipment. Here you need smoothness of dipper control, ease of operation, accuracy in spotting with crawler maneuverability—these mean the difference between combined irritation, low output, daily loss—*or profit!* Only a real Rock Shovel can handle a job like this! The Northwest Dual Independent Crowd, the "Feather-Touch" Clutch Control, Uniform Pressure Swing Clutches and Differential Steering all combine to give greater digging ability. Remember, with a real Rock Shovel you get output in any digging.

CAN YOURS?

INDEPENDENT CROWD plus AUTOMATIC CROWD FOR GREATER DIGGING POWER

The DUAL CROWD

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1514 Field Bldg., 135 S. La Salle St.
Chicago 3, Illinois

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Shovels • Cranes • Draglines • Pullshovels • Truck Cranes

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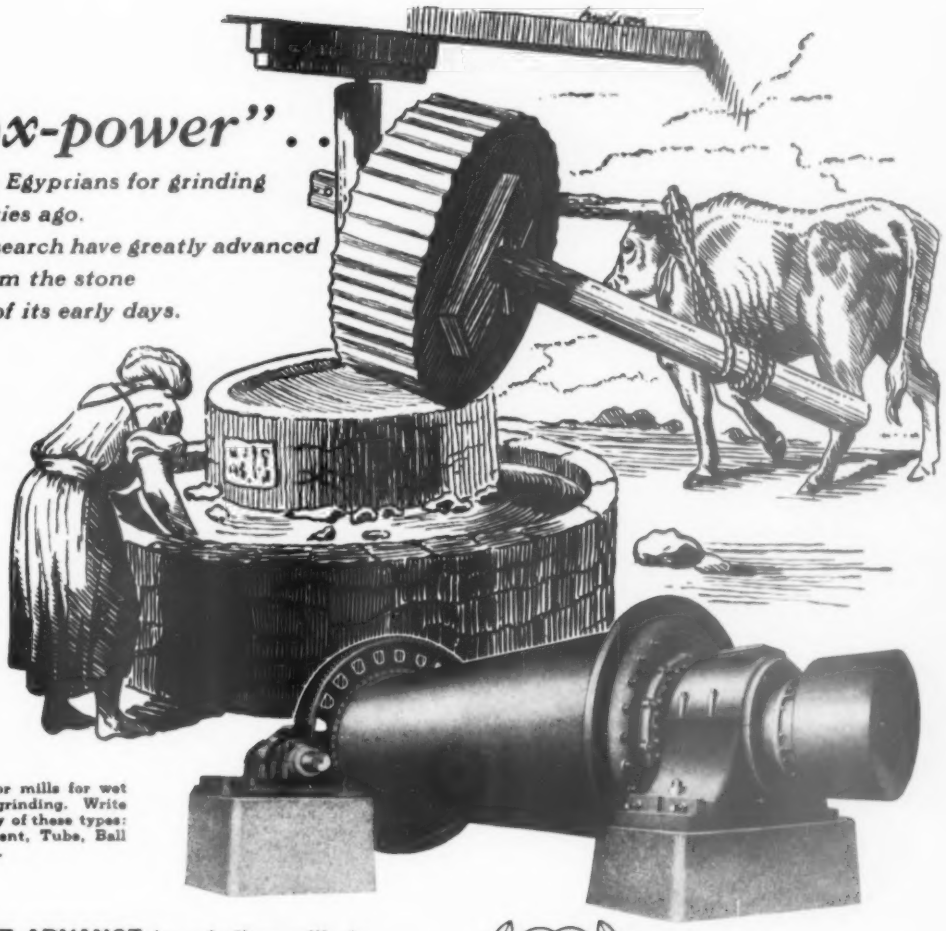
"one-ox-power" . .

was used by the Egyptians for grinding fine lime centuries ago. But time and research have greatly advanced the industry from the stone grinding wheel of its early days.



Traylor builds superior mills for wet or dry, coarse or fine grinding. Write for information on any of these types: Ball, Rod, Compartment, Tube, Ball Tube and Pebble Mills.

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Here's Practical Help For Contractors . . .

Socony-Vacuum gives you . . .

- Help on maintenance problems.
- Individual, tested lubrication schedules.
- Advice on correct application of lubricants, proper handling and storing.
- One source of supply—available everywhere.
- Simplified inventory—with . . .

1. **DELVAC OILS**—for all gasoline and automotive-Diesel engines.
2. **MOBILUBE GX**—multi-purpose gear lubricant for all enclosed gears—manually operated transmissions, rear axles and final drives.
3. **MOBILGREASE**—in grades and types for proper lubrication of all chassis parts and engine accessories.

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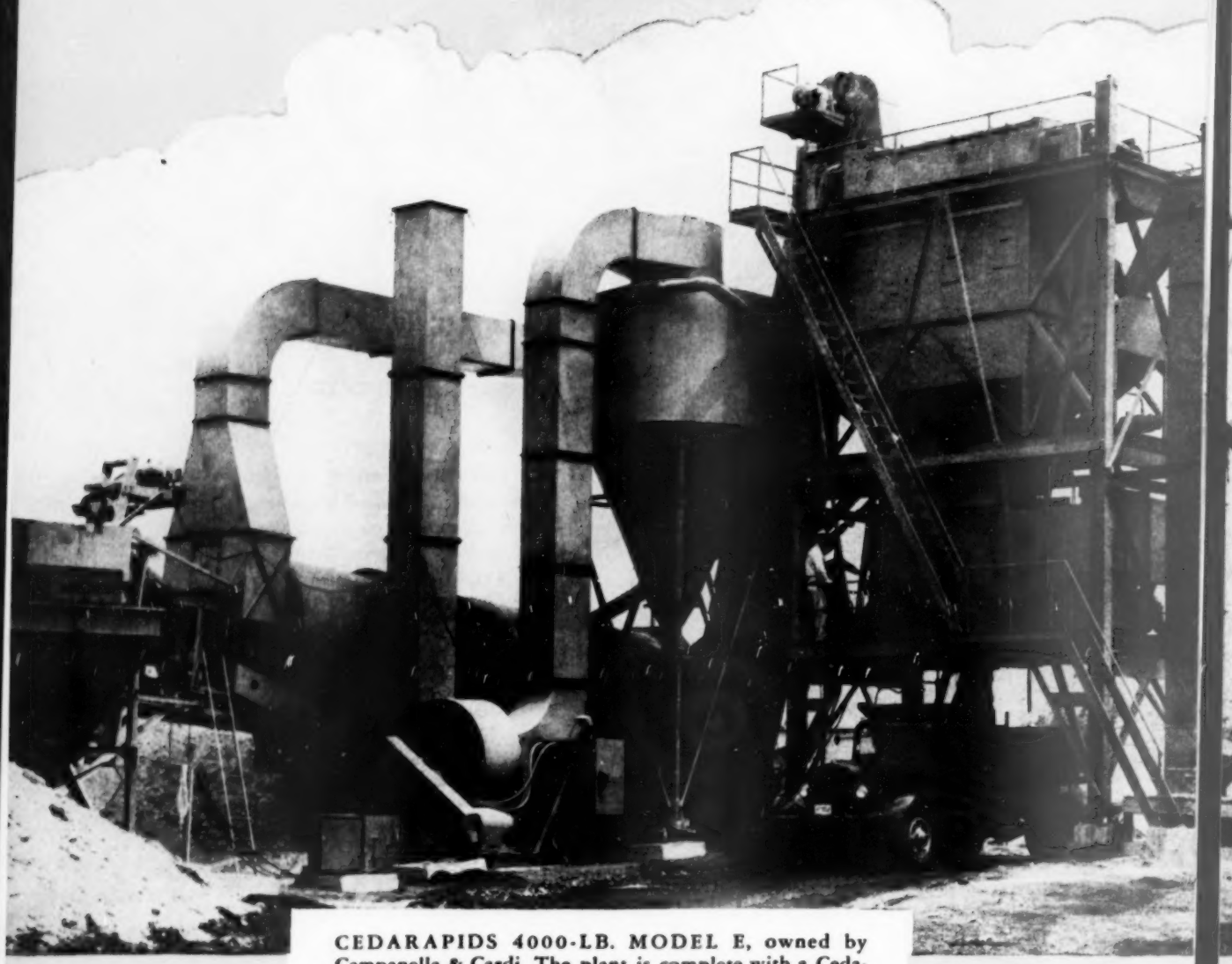
Correct Lubrication for Contractors

THE FLYING RED HORSE COMPANIES: SOCONY-VACUUM OIL COMPANY, INC.
MAGNOLIA PETROLEUM COMPANY. GENERAL PETROLEUM CORPORATION

"WE CAN **BID LOW** ON



CEDARAPIDS 4000-LB. MODEL E, owned by Campanella & Cardi. The plant is complete with a Cedarapids drier, charging hopper and feeder, and a 10′ cyclone type dust collector with dust scavenger and dust elevator.

THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

AIRPORT SURFACING PROJECTS... *that's why we buy* CEDARAPIDS"

says **Campanella & Cardi**
Construction Company
Hills Grove, Rhode Island

HERE'S another contractor who is 100% sold on Cedarapids equipment and the Cedarapids advantages that permit low bids on black top surfacing jobs. Campanella & Cardi are supplying bituminous concrete for the Limestone Air Force Base at Limestone, Maine, using two Cedarapids Asphalt Plants...a 4000-lb. Model E and a Model FA. Their two-year contract calls for production of 150,000 tons for the Base, and with their Model E averaging 125 tons per hour under the direction of Joe Papitto, Superintendent, *the job is now half done and ahead of schedule,* with 75,000 tons already produced!

No wonder so many low-bidding contractors buy Cedarapids!

Check these
money-saving features of CEDARAPIDS Bituminous Mixing Plants

- ✓ High capacity 88" x 28' drier allows operation at full capacity regardless of whether or not aggregate contains a high percentage of moisture.
- ✓ Use of multiple burner type pressure air atomizers results in extremely low fuel oil consumption.
- ✓ Because all mixing takes place below the center line of the pugmill shafts, a completely coated mix can be obtained in 10 to 15 seconds.
- ✓ Built-in portability, rugged construction and fast operating controls result in less downtime. Combined with a faster mixing cycle, these features mean lower costs per ton.
- ✓ Central operator's panel, air controls, signal lights, interlocking time controls, complete portability, self-erecting tower and rapid set-up are a few of the Cedarapids features that insure ease of operation with absolute accuracy of mix to speed production and make possible LOW BIDS.

CEDARAPIDS MODEL FA, also used on the Limestone job. In addition, Campanella & Cardi have a 3000-lb. Model E Plant, purchased in 1945, which is still producing.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Here's what WE mean by

The Newest, Finest

DESIGNED FOR YOUR JOB

These Allis-Chalmers tractors are new models, not merely refinements of existing ideas . . . they are new from the ground up . . . without compromise anywhere in design or material.

They are the answer to your demands for tractors that will give you outstanding performance with any equipment — mounted or drawn. New POWER, WEIGHT and BALANCE put each model in a class by itself! And there's a complete new line of Allied equipment to match these tractors for your job.

BUILT TO "TAKE IT" . . .

These are the finest tractors ever built . . . with ample capacity and strength in every part! And that's no accident! To bring you tractors like these . . . with the qualities you want . . . Allis-Chalmers built them completely new.

You can depend on them to take the loads and jolts of today's jobs . . . because they are modern tractors built for the most grueling operating conditions. They will more than measure up to your expectations!

HD-5
40.26 drawbar hp., 11,250 lb.

HD-9
72 drawbar hp., 18,800 lb.

YEARS AHEAD

Each of these new Allis-Chalmers crawlers gives you a new yardstick for rating tractors. Each sets new standards in its class for performance, strength, servicing, operation. Get the full story from your Allis-Chalmers dealer NOW on this — The Newest, Finest Tractor Line on Earth.

ALLIS-

TRACTOR

Tractor Line on Earth!

EASY TO OPERATE . . .

Operators have long awaited the greater handling ease and comfort now brought to them by this new line of Allis-Chalmers tractors.

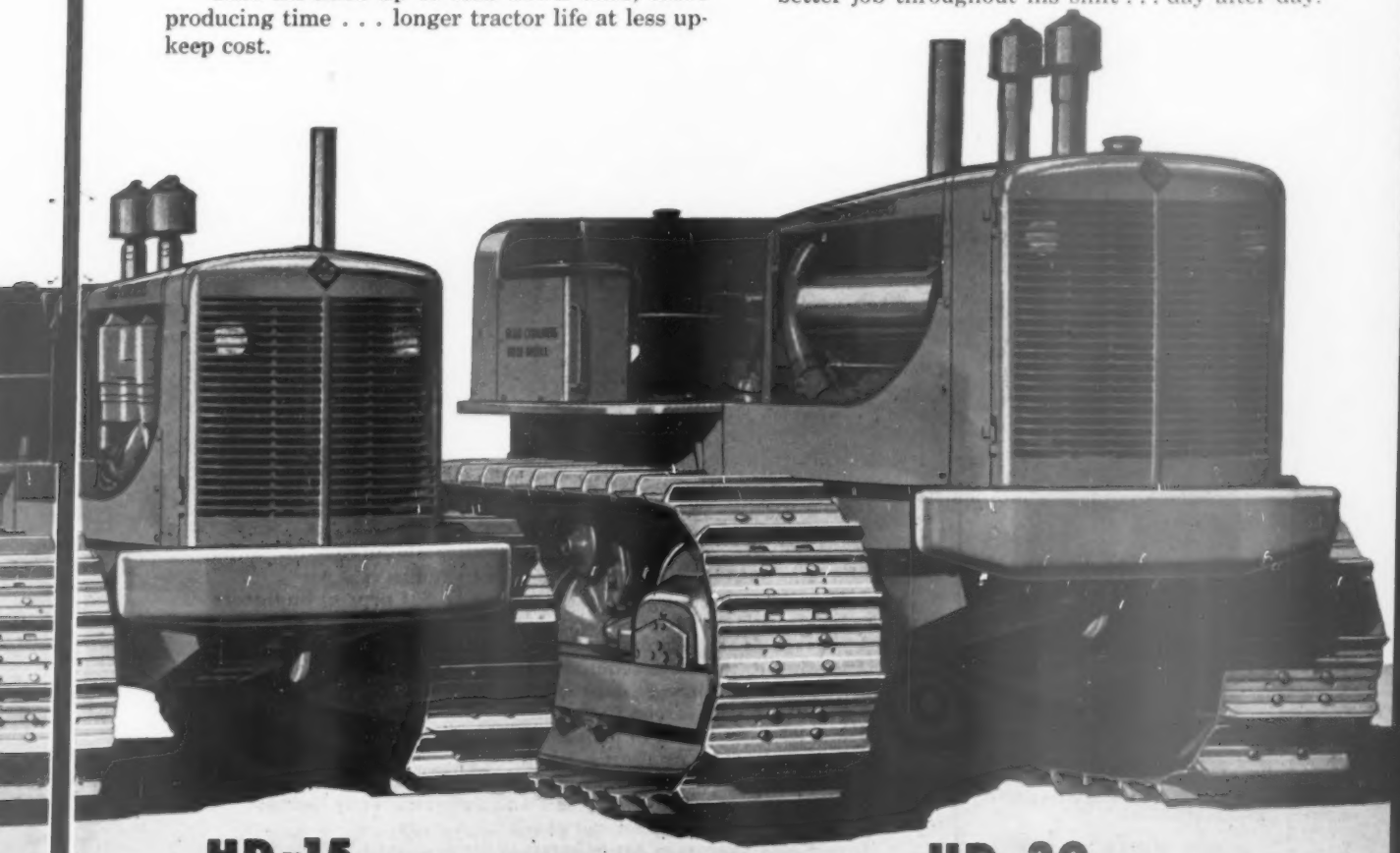
Conveniently located controls respond to the slightest effort . . . and are operated in the same familiar way—nothing tricky to "catch on to." There is new shifting ease, new seat and platform comfort, full visibility.

Because the operator's job is easier — takes less effort — he can maintain a steady pace, do a better job throughout his shift . . . day after day.

EASY TO SERVICE . . .

Adjustments are easier . . . lubrication simplified and lube periods greatly extended. Mechanics say these tractors are the easiest to service and repair.

This all adds up to less down time, more producing time . . . longer tractor life at less upkeep cost.



HD-15
109 drawbar hp., 27,850 lb.

HD-20
Hydraulic Torque Converter Drive, 175 net engine hp., 41,000 lb.

-CHALMERS

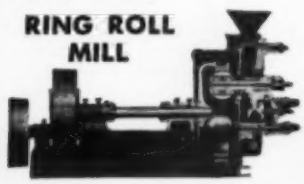
DIVISION • MILWAUKEE 1, U.S.A.

STURTEVANT AIR SEPARATORS

Produce Aggregates that meet Government Specifications

Sturtevant Air Separator in "closed circuit" with pulverizer. This combination increases tonnage and reduces costs in all types of industry.

RING ROLL MILL



Range 10 to 200 mesh. Use this mill in closed circuit with Sturtevant Air Separators.

On dam projects throughout the country, Sturtevant Air Separators are helping contractors meet U. S. Corps of Engineers specifications for proper analysis of aggregates. Here's how — Sturtevant Air Separators de-dust and remove the fine fraction according to the mesh required. Dry or damp sand can be handled in any tonnage desired in ranges from 30 mesh and finer to eliminate screen in the production of intermediate sizes.

The de-dusted sand of proper mesh is then inter-blended with the screened sand or aggregates in the proper proportions providing aggregates that meet specifications.

Sturtevant Air Separators are fast and accurate. They increase production of aggregates, cut production costs.

Investigate Sturtevant Air Separators for your jobs. Write for details, today.

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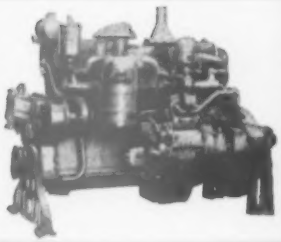
Designers and Manufacturers of: CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS MECHANICAL DENS and EXCAVATORS • ELEVATORS • MIXERS

the power behind the drag



EVERY 40 SECONDS . . . ten hours a day, 26 days a month, 12 months of the year . . . this Northwest Dragline swings 1½ yards of sand and gravel on an excavation job out of Amarillo, Texas.

It takes plenty of steady power to keep a hungry bucket like that going. Western Sand & Gravel Company depends for that power on a D13000 "Caterpillar" Diesel Engine. "Our D13000 has done a splendid job," Company Superintendent P. E. Edwards reports. "Over 5,000 hours of engine operation with little or no repairs."

Five thousand hours—and almost a million tons of sand and gravel moved! "Cat" Diesel Engines are built for two-fisted jobs like that. And smart equipment operators like Superintendent Edwards know they can insure such dependable performance by giving their "Cat" machines the kind of care they deserve.

Good equipment maintenance pays off more today than ever before. So today, more than ever, check wear before it happens. Your Operator's Instruction Book can help you often. And your "Caterpillar" Dealer is always handy. Call on both—they'll keep your machines on the go!

CATERPILLAR

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DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

Proven • • • new types of

the rock buster

A powerful Impact type Primary Crusher for reducing hard friable material.

30" Feed — 4" to 1" Product

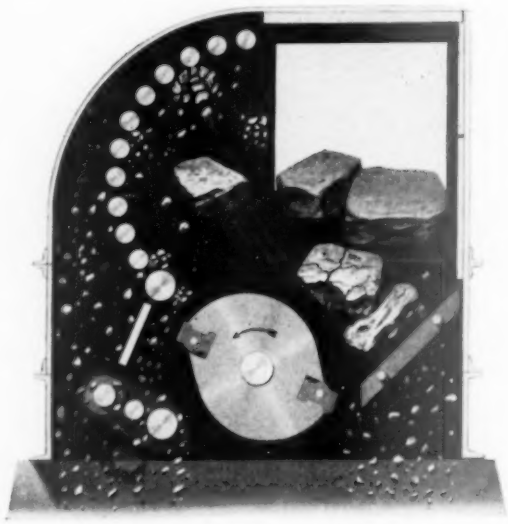
Capacity — 60 to 250 Tons per Hour

Reduces material while it is in suspension. High speed, Two-Ton Rotor equipped with stationary Breakers.

Material fed onto a sloping Grizzly of desired bar spacing.

Grizzly by-passes fines — directs oversize material into path of rotor.

Bulletin No. 827



reversible swing hammer

for large capacities — Minimum 'down-time'

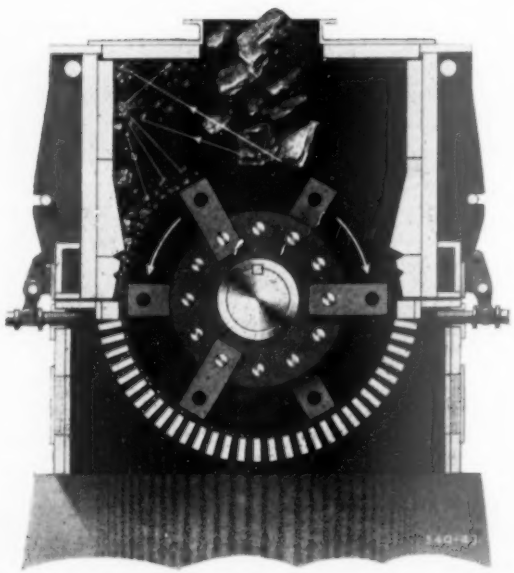
Product — 85% — ½" and under

Machine is symmetrical about vertical center line.

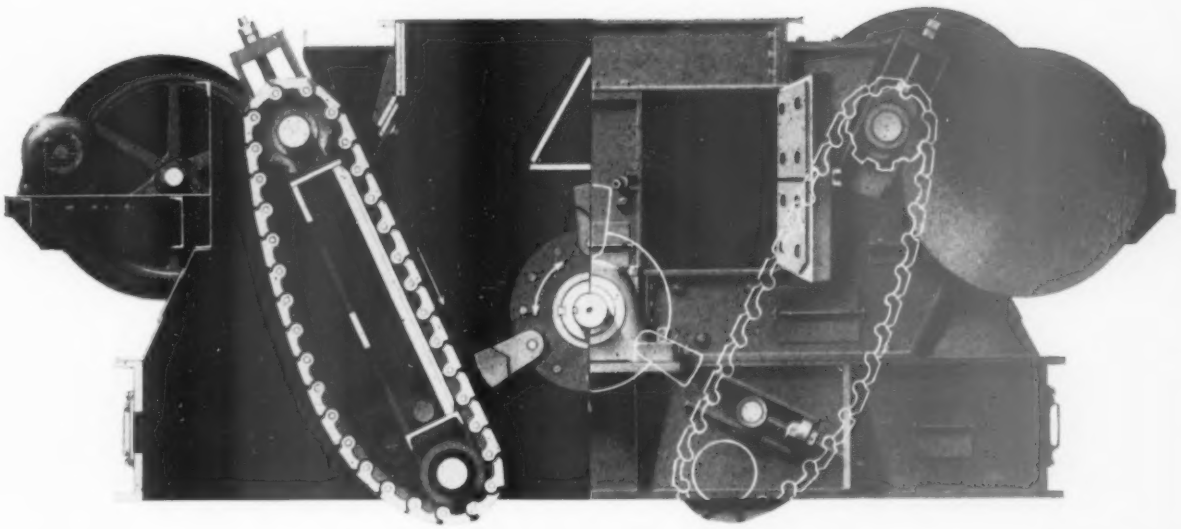
When one corner of hammers becomes worn, rotor direction is reversed to use opposite faces of hammers.

Extra heavy construction — welded plate steel — removable manganese liners — anti-friction bearings.

Catalog No. 837



Crushers for Cement Mills
. . . Stone Industry



mud hog . . . reversible . . with traveling breaker plates

for crushing wet sticky material—clay, shale, ores, cement rock, limestone and many chemicals.

30" maximum feed — 4" to 1" Product

TWO Crushers in ONE—breaker plates adjustable for different size product—use one side for one product, opposite side for different product.

Reversing crusher is accomplished by simply reversing the motor through the starter.

Bulletin No. 811

We will be glad to go into detail—write us when you are ready for that BIG crushing job.

THE JEFFREY MANUFACTURING COMPANY
935 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

Jeffrey Mfg. Co. Ltd., Montreal, Canada
British Jeffrey-Diamond Ltd., Wakefield, England
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.
The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
Galion Diesel Britain Ltd., Wakefield, England
The Ohio Wakefield Iron Co., Columbus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio

BILLITON MINES

3 LeTourneau Rear-Dump Haulers perform so well in South American mine that owner brings in 6 more

Deep in the tropical jungles of Surinam, Billiton Mines of Paramaribo operates an extensive bauxite pit and mill 24 hours a day, the year around. They are stripping clay overburden from ore deposits and hauling bauxite rock to crusher.

On this multi-handling work, Billiton Mines had always hauled both their overburden and pit ore in shovel-loaded, narrow-gauge rail cars. Last winter, however, to maintain profitable output as operations were extended into new areas where haul grades were steeper, they turned to LeTourneau rubber-tired, rear-dump Tournarockers. These rear-dump trucks easily climb the 10% slopes which the locomotives could not negotiate, and, despite extreme equatorial heat and very heavy rains (120 inches annually), keep production on schedule.

1500-ft. cycle every 6 minutes

When these photos were taken, Billiton Mines was using 3 of these 16-ton, rear-dump haul units to remove 20 feet of heavy, wet clay overburden. Shovel-loaded, each Tournarocker carried 15 cu. yds. per trip — made 10 trips an hour on 750 ft. one-way haul up 10% grades. That's 150 cu. yds. per unit per

R. G. LeTOURNEAU, INC.

HIGH-SPEED, RUBBER-TIRED HAULING • EXCAVATING

triples Tournarocker fleet

Under 8-yd. shovel, Tournarocker's 12'3" x 8' top opening provides big target for fast loading. Giant 21.00 x 25 low-pressure tires give ample flotation and traction for pulling out of wet, muddy pit.

With ample horsepower for big loads, Tournarocker has plenty of power to haul through deep mud and up slippery 10% grades from pit to dump.

hour, and a combined output for the 3 high-speed Tournarockers of 450 cu. yds. hourly.

Performance of these 3 units has been so satisfactory under extremely adverse working conditions that Billiton Mines has added 6 more Tournarockers to their fleet. Upon completion of stripping, the 9 units will haul bauxite ore 1 mile from pit to mill.

Whether you are moving clay, gravel or rock, this advanced earthmoving equipment can mean lower costs and increased production on *your* mining operations, too. Tournarockers are available in 9, 18, 35 and 50-ton sizes. Your nearest LeTourneau Distributor will be glad to give you all the facts on these highly mobile rear dumps. Call him, or write today.

Front-wheel-drive Tournarocker safely backs to edge of soft bank, dumps load into mined-out area. Body raises quickly at touch of dashboard electric switch.

Tournarocker-Trademark 8X98

PEORIA, ILLINOIS

● **LIFTING EQUIPMENT**

SHORT CUT TO MORE

OF CLEAN CUBICAL

SINGLE 3240 IMPACT MASTER IN CLOSED CIRCUIT SETUP GIVES DILLON STONE COMPANY PROFIT-MAKING CAPACITY

Under normal operations, the Dillon Stone Company, Columbus Junction, Iowa, feed their closed circuit IMPACT MASTER setup with a ¾ yard shovel and 3 quarry trucks to turn out an average of 110 — 120 tph to meet market demands. Their product is approximately 28 percent minus 1¼" plus ¾", 38 percent minus ¾" plus #4 mesh, and 34 percent agricultural limestone.

ADDS SHOVEL . . . DOUBLES OUTPUT

During their peak operating period last summer, they added another ¾ yard shovel, increased their quarry trucks to 6, and stepped up production to over 200 tph of minus 1¼" . . . at times reaching a peak of 240 tph. No other additions were made on the plant. The single 3240 IMPACT MASTER does the complete crushing job with 135 hp.

WRITE FOR LITERATURE

More production with minimum plant investment is just one of the profit-making features of the PMCO IMPACT MASTER. Get proof of performance for yourself. Find out how "Controlled Impact Action" works to give you a better quality uniform gradation cubical aggregate, how it gives you greater control over finished product size with simple mechanical adjustments changing the percentage of sizes when desired. PMCO IMPACT MASTERS are available with capacities to 500 tph. Write today for details.

PETTIBONE MULLIKEN CORPORATION

4700 West Division St., Chicago 51, Illinois Phone Spaulding 2-9300

PRODUCTION AGGREGATE

CONTROLLED IMPACT ACTION

Dillon Stone Company's closed circuit setup with 3240 IMPACT MASTER, 36" x 12' apron feeder, 5' x 14' 3-deck screen, 30" x 16' breaker conveyor, 24" x 100' main plant conveyor, 18" x 62' return conveyor, 23 yard bins, and portable stockpiling conveyor. To the right, a close-up view of the single 3240 IMPACT MASTER which does the complete crushing job.

GET PROFIT-WISE GO PMCO

Equipment for Better Dust and Fume Collection

Norblo dust collection equipment includes the three distinct types shown above—centrifugal, hydraulic, and bag type. While each type has advantages in specific conditions or applications, Norblo Automatic Bag Type is the wheelhorse for modern, large scale, heavy duty or continuous service. The largest installations of dust collection equipment in North America are fuming installations in the smelting field. Some of these move air by the millions of tons a year.

Up to the present moment no type of large scale dust or fume collecting equipment has proved itself more efficient, or lower in operating and maintenance cost in continuous large scale operation than Norblo Automatic Bag Type Dust Collectors. Get the facts.

THE NORTHERN BLOWER COMPANY

Engineered Dust Collection Systems for All Industries

6408 BARBERTON AVE. • CLEVELAND 2, OHIO

One Le Roi Airmaster 600 cfm Compressor provides all the low-cost air you need to operate the T286 Dual Drill Rig when it is equipped with Le Roi-CLEVELAND 4" drifters. A smaller compressor is sufficient, when the T286 is equipped with the 45-lb. H10 or 80-lb. H23 sinker drills or 3½"-bore D25 drifter.

OUTDRILL TWO STANDARD WAGON DRILLS!

Tow your compressor! Go places you couldn't get to before!

Use a Le Roi-CLEVELAND T286 Self-Propelled Dual Drill Rig

Now you can make your set-ups easier, faster, on any kind of ground — without tugging or pushing your wagon drills or compressor. Just use a Le Roi-CLEVELAND T286 and *drive it* right where you want it!

The T286 is a 25-hp tractor (3 speeds forward, 1 speed reverse) that has two Le Roi-CLEVELAND patented air feeds and drills mounted on a specially-constructed front-end base. You can use this self-contained unit to drill in any direction — at any angle within a radius of 360° — with less air.

Standard air feed provides for a 10′ steel change — other changes optional. Feed-speed and bit-pressure suit all conditions. You can drill and clean holes as deep as 30′ easily — with either steel or tungsten carbide-tipped bits.

One contractor used his T286 to move 25,000 yards of Adirondack Bastard Granite — an extremely hard, abrasive rock — for half the price per yard he had figured for the job.

Get faster set-ups, better hole spacing, greater footage, better fragmentation, and lower costs on *your* next wagon-drill job. Specify the Le Roi-CLEVELAND T286 Self-Propelled Dual Drill Rig. See your nearby Le Roi distributor.

Send coupon for free Bulletin RD21.

LE ROI COMPANY
CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
Plants:
Milwaukee, Cleveland and Greenwich, Ohio

TEAR OUT COUPON AND MAIL TODAY!

LE ROI COMPANY, Dept. RP-2
12500 Berea Road, Cleveland 11, Ohio

Send me free copy of Bulletin RD21.

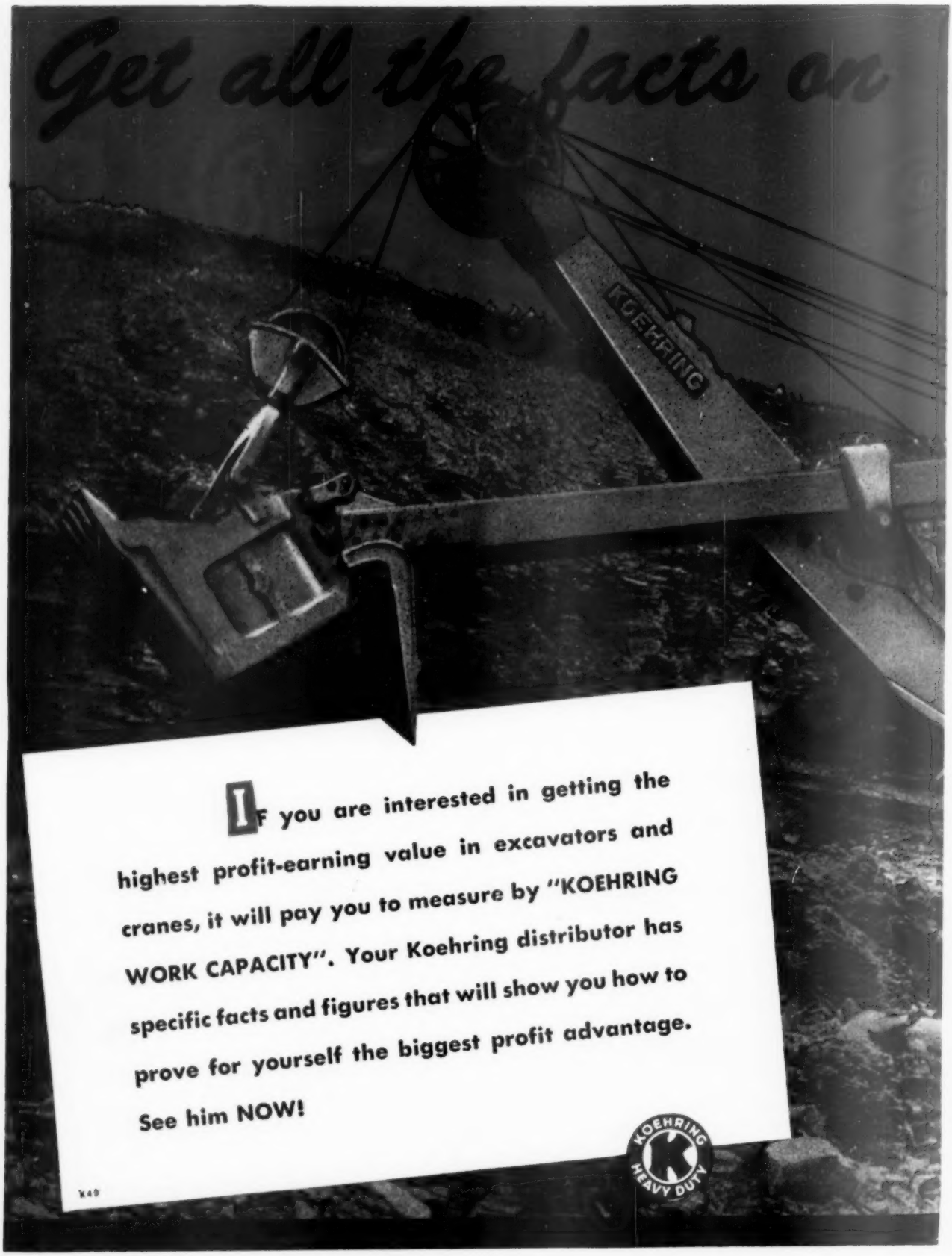
Name ..... Title .....

Company Name .....

Company Address .....

City ..... ( ) State .....

C-136


Get all the facts on
KOEHRING
IF you are interested in getting the highest profit-earning value in excavators and cranes, it will pay you to measure by "KOEHRING WORK CAPACITY". Your Koehring distributor has specific facts and figures that will show you how to prove for yourself the biggest profit advantage.
See him NOW!
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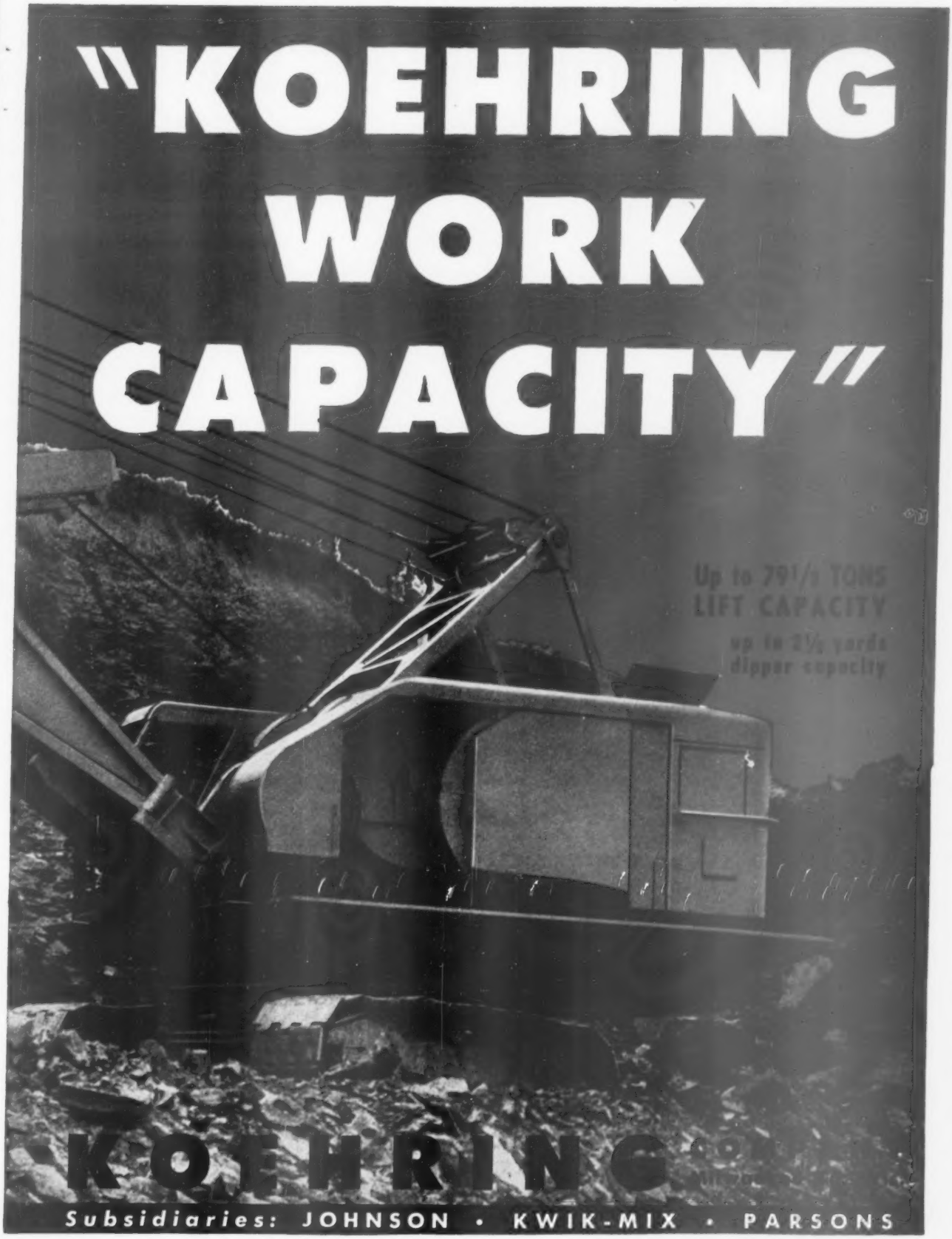
HEAVY DUTY


"KOEHRING
WORK
CAPACITY"
Up to 79½ TONS
LIFT CAPACITY
up to 2½ yards
dipper capacity
KOEHRING
Subsidiaries: JOHNSON • KWIK-MIX • PARSONS

up to 25% more production

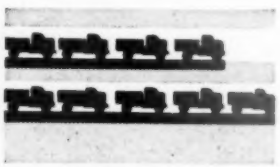
LINK-BELT SPEEDER with *Speed-o-Matic* controls

A real glutton in a gravel pit—up to 800 yards a day! This Link-Belt Speeder LS-51 keeps the gravel rolling fast, keeps operators fresh and alert, steps up production—and profits.

Speed-o-Matic **full hydraulic controls mean stepped-up production**

Speed-o-Matic Controls — fully hydraulic! You "feel" the load all the way. Simple, easy — fingers instead of muscles do work.

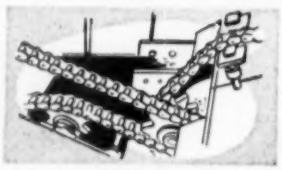
Eliminates up to 150 parts — cuts friction, no worn bushings, pins, links or clutch toggles to put you "down."



Up to 25% more production — fast operating cycle steps up output and profits. Effortless control keeps operator fatigue down.

Here are other LINK-BELT SPEEDER plus features that work for you

All-Welded Stress-Relieved Construction—extra strength without extra weight. Resists impact, twist. Field service simple.



Independent Chain Crowd — is fast and positive. Self-adjusting to all boom angles. No cables to break, slip or adjust.

Convertibility — designed for peak production as shovel, crane, dragline or trench hoe. Convert in field — quickly, easily.

Service—fast, efficient. Link-Belt Speeder Service is nation-wide—near you with replacement parts, factory-trained mechanics.

LINK-BELT SPEEDER
CORPORATION
12,701

Builders of the most complete line of shovels, cranes and draglines

CEDAR RAPIDS, IOWA

SAFETY
on the Job

Enjoy the satisfaction of knowing that you, too, have taken every safety precaution on your blasting jobs. You can remove many a hazard if you "*Hook Up and Detonate with PRIMACORD.*"

Primacord cannot be set off by friction, sparks or ordinary shock — it requires a blasting cap. It is not affected by stray currents.

Safety is not the only reason you need Primacord. Its use means faster, easier loading; positive firing of every cartridge in the hole; better fragmentation in planned shots. It helps to keep your shovels digging with pay dirt in every load.

For further facts, ask your explosives supplier, or write direct

THE ENSIGN-BICKFORD COMPANY
SIMSBURY, CONNECTICUT

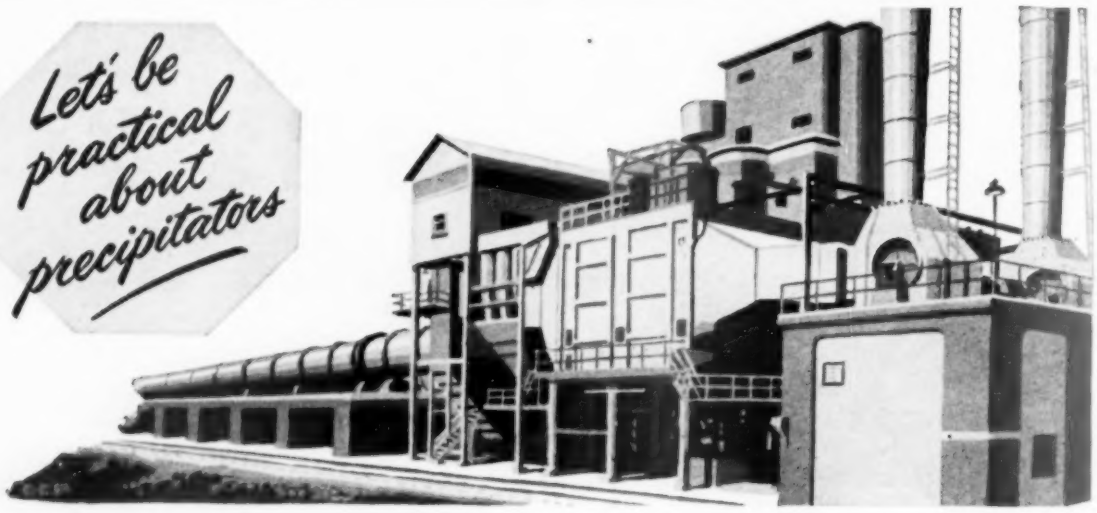
Also Safety Fuse since 1836

PLAIN PRIMACORD for shallow holes and surface trunk lines; **REINFORCED PRIMACORD** for deep holes and resistance to abrasion; **WIRE COUNTERED PRIMACORD** for deep ragged holes; **PLASTIC REINFORCED PRIMACORD** for deep, wet holes and river crossings.

Use PRIMACORD®

The PROVED and APPROVED DETONATING FUSE

Let's be practical about precipitators



A Koppers-Elex electrostatic precipitator like this one (shown on a cement dust application) can be your best investment in nuisance abatement. Inherent efficiency of the design is high enough to meet all present and proposed nuisance abatement requirements . . .

Here's what you can do *today* to meet more stringent nuisance abatement laws of the *future!*

IT'S ALMOST a foregone conclusion that nuisance abatement laws all over the country are going to be tightened up. That's one big reason why you should specify Koppers-Elex electrostatic precipitators. Koppers has proved designs right now which clean process gases down to .15 grain per cubic foot residual and less! And that performance is well within most existing or contemplated nuisance abatement requirements.

Re-entrainment, the big problem in nuisance abatement, is held to an absolute minimum because rapping is sectionalized. Successive collection zones are separately energized to provide highest voltage in each field for maximum cleaning. You may specify either conventional storage type hoppers or Koppers *unique bottom drag scraper* which gives you continuous dust feed!

Hundreds of Elex precipitators have been installed in plants all over the world. Koppers-Elex precipitators include "packaged" mechanical or vacuum tube power packs which can be installed in any convenient area in the plant. This means that these electrostatic precipitators are more compact, easier to install around existing facilities.

PERFORMANCE GUARANTEED!

Koppers engineers protect your investment in an electrostatic precipitator by guaranteeing both the recovery or gas-cleaning efficiency and the residual content left in the gas after cleaning. Koppers-Elex electrostatic precipitators are designed, engineered, fabricated, erected and guaranteed under one contract by Koppers Company, Inc.

IF YOU HAVE A GAS-CLEANING PROBLEM, write today and outline the details for us to review. There is no obligation. Just address your letter to: KOPPERS COMPANY, INC., *Precipitator Dept.*, 272 Scott Street, Baltimore 3, Maryland.

KOPPERS®

Koppers-Elex ELECTROSTATIC PRECIPITATORS

coverage alone is not enough

In packaging, your product requires more than *just* coverage. It requires a container that assures the best protection for your product, the best acceptance of your product. Your Chase Salesman is technically trained to study your packaging requirements—and to recommend the specific container that is designed to meet your particular needs.

CHASE Multiwall Paper Bags

• Multiwall Paper Bags, Single Wall and Duplex Paper Bags • Saxolin open mesh bags • Cotton bags of all kinds • Lined and Combined bags, liners and specialties

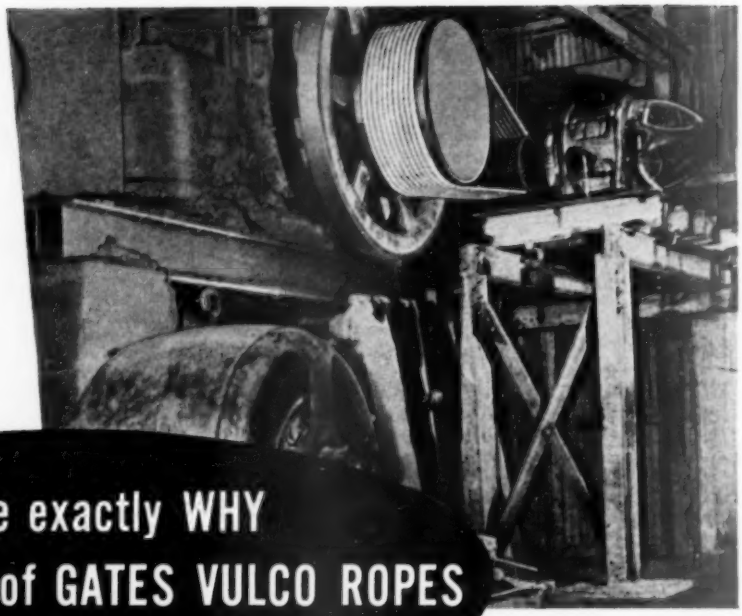
SINCE 1847

for Better Bags...Better Buy Chase

CHASE BAG CO. GENERAL SALES OFFICES: 309 W. JACKSON BLVD., CHICAGO 6, ILL.

BOISE • DALLAS • TOLEDO • DENVER • DETROIT • MEMPHIS • BUFFALO • ST. LOUIS • NEW YORK • CLEVELAND • MILWAUKEE
PITTSBURGH • KANSAS CITY • LOS ANGELES • MINNEAPOLIS • GOSHEN, IND. • PHILADELPHIA • NEW ORLEANS • ORLANDO, FLA. • SALT LAKE CITY
OKLAHOMA CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS • CHAGRIN FALLS, O. • WORCESTER, MASS. • CROSSETT, ARK. • SAN FRANCISCO

A large jaw crusher at the mill of a big copper mine in Sonora, Mexico, is driven by Gates Vulco Ropes. Picture shows the discarded motor still in foreground.



Let's see exactly WHY the Concave Sides of GATES VULCO ROPES mean lower V-Belt Costs!

Every engineer knows how a V-belt *changes shape* when it bends around a pulley.

The top of the belt is under tension—making it grow *narrower*.

The body is under *compression*, causing the sides to bulge out!

Look at figure 1-A in the diagrams, herewith. There you see how a *straight sided* V-belt is forced to bulge in its sheave-groove—and this bulging naturally causes extra wear along the middle of the sides as indicated by the arrows.

Now look at the figure 2-A. There you see how the precisely engineered Concave Sides fill out to an exact fit in the sheave groove.

Clearly, the Concave Sides press *evenly* against the V-pulley. This means uniform wear; longer life! The Concave Sides have *full traction;* wear longer because of *full contact!*

To sum up: The Concave Sides of Gates Vulco Ropes (U.S. Patent No. 1813698) give you (1) Less wear, (2) More pulley contact, (3) More sure power transmitted when needed!

Only V-belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure you get the V-Belt with the Concave Sides—The Gates Vulco Rope!

What Happens When a V-Belt Bends

Straight-Sided V-Belt

Fig 1

Fig 1-A

How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

Gates Vulco Rope with Concave Sides

Fig 2

Fig 2-A

The Concave Sides Fill out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-521

World's Largest Maker of V-Belts

Gates

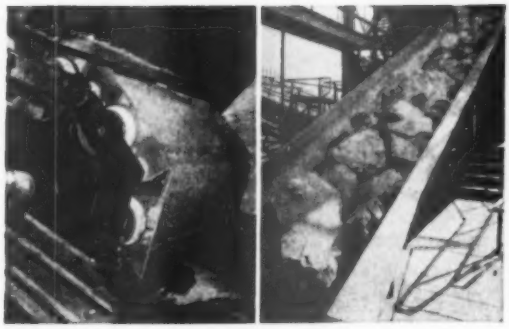
Hose V-Belts
Molded Rubber Goods
for Industry

VULCO ROPE **DRIVES**

ENGINEERING OFFICES AND JOBBER STOCKS IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY • DENVER • U•S•A

It pays to choose a feeder that fits your operating requirements

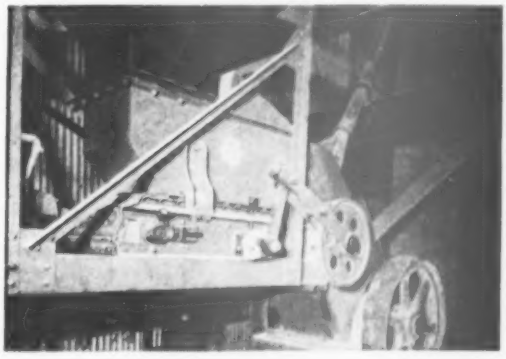


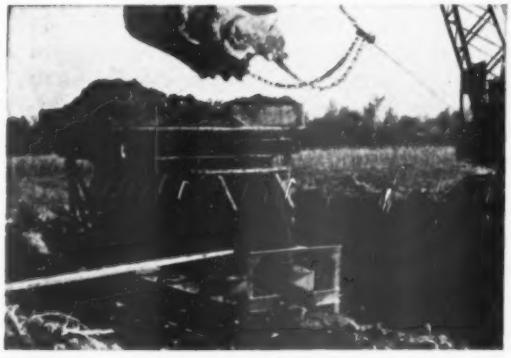
FOR HEAVY IMPACT SERVICE

Where material consisting of heavy, sharp or abrasive large lumps must be handled, Link-Belt Heavy Duty Apron Feeders are the answer. Severe service—including high temperature and heavy impact—causes no trouble for these rugged feeders. Four designs meet varying operating needs. Widths from 18 to 60 in.

FOR ACCURATE FEEDING

The Link-Belt Apron Feeder at right provides a uniform flow for smaller tonnages. Relatively short pitch chains and apron pans are employed. The drive is arranged to provide easy adjustment of feed to the crusher, permitting great flexibility to meet varying operating conditions.





FOR SMOOTH, UNIFORM FLOW

Smooth operation and uniform discharge are assured with Link-Belt Belt Feeders. Free-rolling roller bearing idlers require less lubrication and adjustment. Adjustable skirting provides seal to prevent leakage. Recommended for all materials except those that are hot, fluffy or exceptionally large lump. Belt widths from 18 to 48 in.

LINK-BELT makes a complete feeder line . . . offers the right one for your requirements

In addition to the types above, Link-Belt builds bar flight, screw, oscillating, rotary table, rotary vane and reciprocating feeders. But Link-Belt offers more than a complete quality line to help you get the most efficient application. Link-Belt engineers base their recommendations upon a working knowledge gained in hundreds of plants over many years. Not only for feeding — for conveying, washing, classifying and screening as well — you can rely on Link-Belt all the way.

LINK-BELT

CONVEYING and PREPARATION MACHINERY

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

12,000

NO. 4 OF A SERIES

ON HOW TO

Stretch a MULTIWALL Paper Bag

Kraft paper supplies are short. So it is important for you to get the best use from your multiwalls. Here are a couple of good ways to stretch them . . .

USE THE EXPERIENCE OF BEMIS SALESMEN AND SERVICE MEN

From installation of equipment to car-loading, Bemis men can often give money-saving help. Here is an actual case:

A mill complained that multiwalls were breaking going through the bag flattener. A Bemis Salesman found that—

1. The chute from the valve packer was too steep. The bags hit the flattener rolls too fast.
2. An obstruction in the chute made small cuts in the bag.
3. The guide rails were too far apart so some bags entered the rolls on the diagonal.

The causes of trouble were eliminated . . . everybody benefited.

USE A BEMIS SEWING MACHINE CLINIC

These clinics are informal instruction periods conducted by specially trained Bemis experts for plant personnel who supervise and use bag closing sewing machines. There are demonstrations and discussions on sewing machine operation and maintenance. Motion pictures show efficient installations, the dismantling and reassembling of sewing heads, etc.

Bemis specialists also assist in planning production line changes . . . and they will recommend new types of equipment, describe latest methods, or help you with special packaging problems.

Want the Whole Story?

Ask your Bemis Man for a copy of the illustrated Bemis Multiwall Packing Guide. It deals with Storage, Filling and Closing, Handling, Palletizing and other important subjects that will help you make your multiwall bags serve you better.

• • •

Maybe Cotton Bags are Your Answer . . . if you can't get all of the multiwalls you need. Cotton bags are available . . . and Bemis is the leading cotton bag source.

Bemis BEMIS BRO BAG COMPANY

St. Louis 2, Missouri

Get the solid facts!

See how you save with

CHEVROLET

Advance-Design

TRUCKS

Fact No. 1

PAY LESS AT THE START

Chevrolet trucks list for less than any other trucks built to handle the same payloads. Here is a real, money-in-the-bank savings on purchase price. And you'll find the Chevrolet brings you ruggedness, stamina and great truck features not found in many other trucks.

Fact No. 2

GET LOWER ON-THE-JOB COSTS

Chevrolet trucks give you Valve-in-Head economy that saves gas, four-way engine lubrication that reduces wear and saves oil, and tough, rugged construction for longer truck life. Like truck users everywhere, you'll find Chevrolet trucks cost less to own and maintain.

Fact No. 3

TRUCKS BUILT FOR YOUR PAYLOADS

Chevrolet trucks are *factory-matched* to meet your requirements. You get the right truck for the job . . . never "too much" or "too little" truck. Frame, axles, springs, body, brakes, and power form a *balanced team.*

Fact No. 4

BIGGER TRADE-IN VALUE

Records show that Chevrolet trucks traditionally bring more money at re-sale or trade-in than many other makes. Chevrolet's market value stays *up* because the value stays *in.* More reason to see your Chevrolet dealer for your best truck buy!

ADVANCE-DESIGN CHEVROLET TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • **POWER-JET CARBURETOR**—for smooth, quick acceleration response • **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement • **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting • **HYPOID REAR AXLE**—for dependability and long life • **TORQUE-ACTION BRAKES**—on light-duty models • **PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES**—on medium-duty models • **TWIN-ACTION REAR BRAKES**—on heavy-duty models • **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models • **CAB SEAT**—with double-deck springs for complete riding comfort • **VENTI-PANES**—for improved cab ventilation • **WIDE-BASE WHEELS**—for increased tire mileage • **BALL-TYPE STEERING**—for easier handling • **UNIT-DESIGNED BODIES**—for greater load protection • **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

BUCYRUS ERIE

6 YARD

150-B POWE

NEW SPEED, R, CAPACITY

to loading and stripping

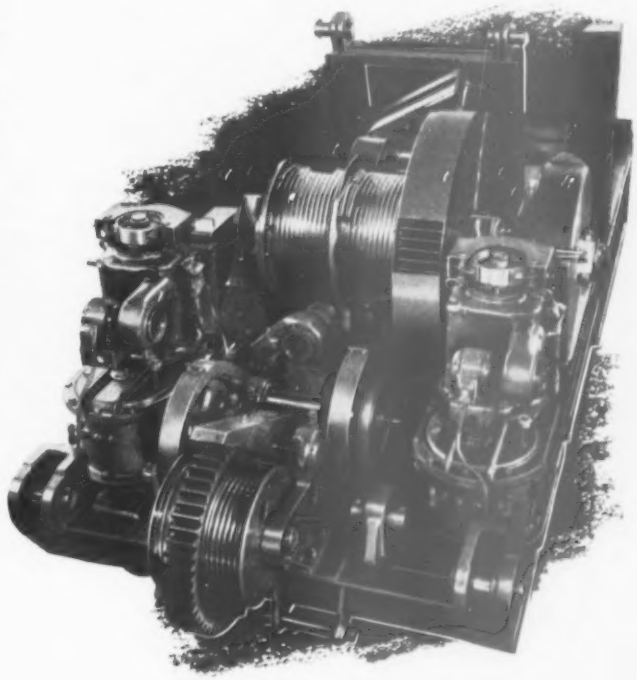
ADDED to the time-proved superiorities of design and construction which have made Bucyrus-Erie quarry and mining shovels traditionally "years ahead" are important features new to an excavator of this size, yet *thoroughly proved in the field*. Among these 150-B features are:

Exclusive Two-Section Boom with tubular dipper handle free to rotate in saddle block. Used with outstanding success on Bucyrus-Erie's large stripping shovels, this design speeds the working cycle and permits increased *payload* because it reduces front end weight materially yet provides enormous strength. Upper section carries only load resulting from pull of ropes, strong trussed lower section transmits directly to the revolving frame the vibrations, torsional and shock loads set up in digging. Rope crowd is quiet, positive, with crowd machinery located on the deck.

Powerful New Main Machinery designed for double twin hoist smoothly delivers power where you want it, when you want it. Hoist machinery pulls dipper straight through tough banks with steady positive action. Fast, smooth swing, with quick acceleration and deceleration, shaves seconds off every cycle.

Larger Stronger Mounting has new propelling machinery arrangement, which provides rapid engagement of the propel for fast move ups. Cored box-section tread links have separate flame hardened wearing paths for rollers and driving tumblers. Cat belts have high wear resistance, stay in adjustment for long periods.

The 150-B has full Ward Leonard independent motor control, is fully convertible to dragline service, features numerous other design advances that make it truly "years ahead". 1152C



BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

There's only one
TAPER-LOCK

Precision-Grooved

True Running

Easy on—Easy off

TAPER-LOCK bushing grips the shaft for the full length of the bushing — holds sheave with firmness of a shrunk-on fit. No wobble. Taper-Lock runs true!

No flange — no collar — no protruding parts. Flush machine-tool appearance.

Finest grade of close-grained semi-steel, cast in the Dodge foundry.

The grooves, machined on precision equipment, have identical pitch diameters. This insures equal belt tension. Every belt pulls its share of the load!

TAPER-LOCK sheaves are available from distributors' stocks in complete range of sizes in A, B, C and D grooves.

DODGE SEALED-LIFE BELTS have special protection for tension members, insuring longer belt life. Perfectly matched to TAPER-LOCK sheaves.

DODGE MANUFACTURING CORPORATION, 2600 Union Street, Mishawaka, Ind.

DODGE
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified phone book.

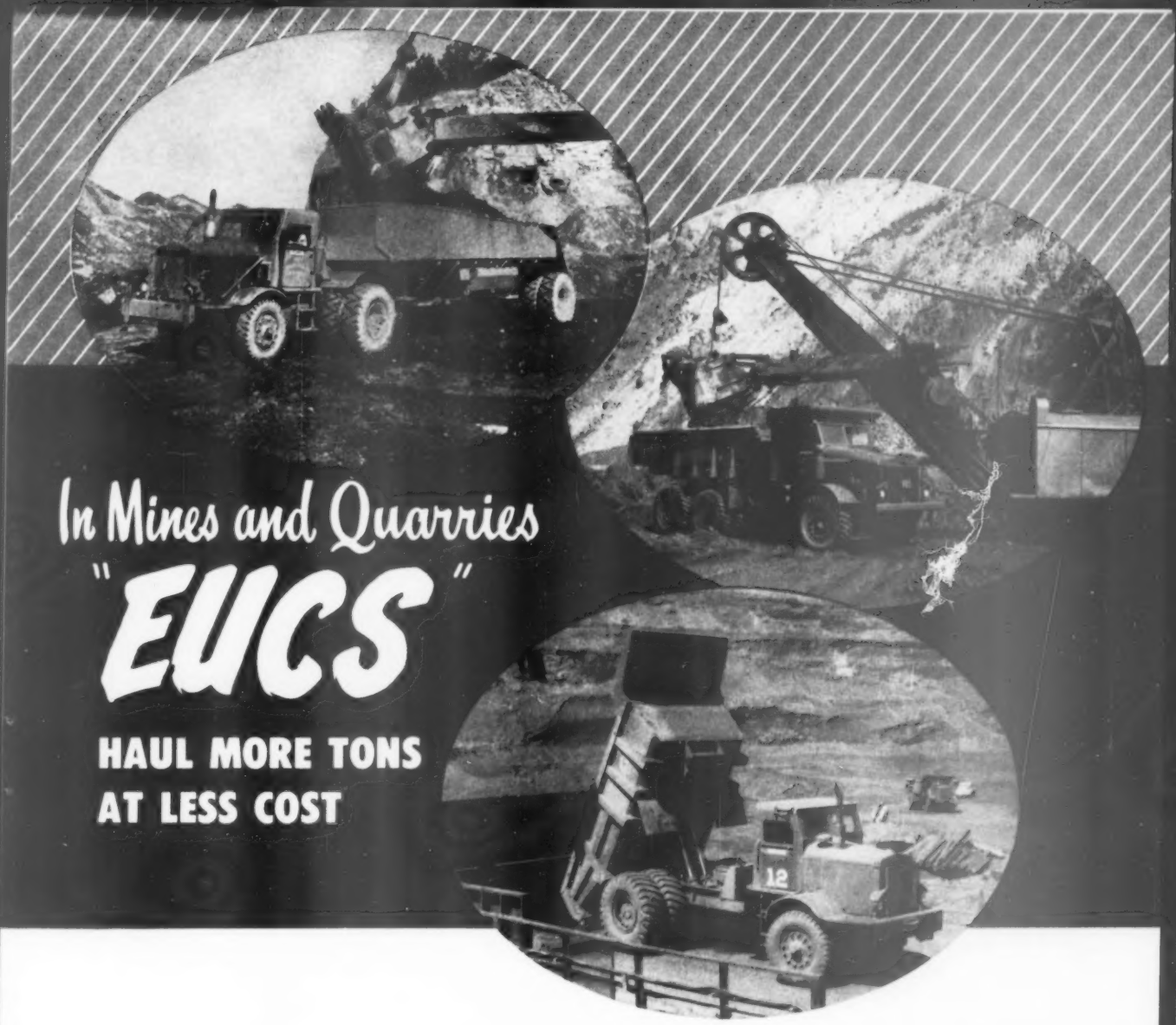
FIRST IN POWER TRANSMISSION MACHINERY!

V-BELTS AND TAPER-LOCK SHEAVES

DODGE TIMKEN PILLOW BLOCKS

ROLLING GRIP AND DIAMOND 9 CLUTCHES

SOLID STEEL CONVEYOR PULLEYS



In Mines and Quarries "EUCS"

HAUL MORE TONS AT LESS COST

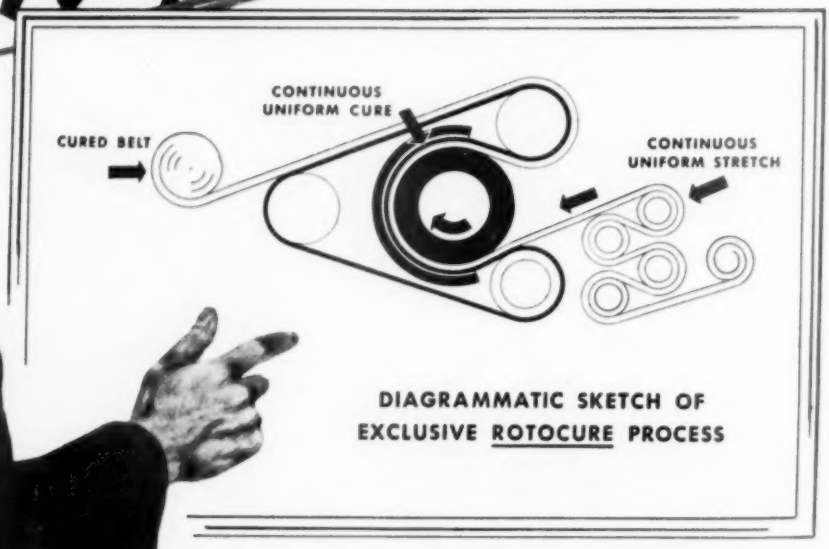
Built for tough off-the-highway hauling, Rear-Dump and Bottom-Dump "Eucs" have stepped up production and cut hauling costs on hundreds of open pit mining and quarry operations.

Euclids have proved their efficiency and long life in hauling a wide variety of materials . . . coal, ore, rock, overburden and other heavy excavation. Bottom-Dumps are powered by diesel engines of 190 to 300 h.p. . . . loaded speeds up to 34.4 m.p.h. . . . available in 20 to 40-ton capacities. Rear-Dump "Eucs" have travel speeds up to 36.3 m.p.h. . . . powered by diesel engines of 125 to 400 h.p. . . . range in capacity from 10 to 34 tons.

Your Euclid Distributor has performance data on jobs similar to yours. Ask him for a Euclid hauling cost estimate — there's no cost or obligation.

The EUCLID ROAD MACHINERY Co. • CLEVELAND 17, OHIO

Keep 'em Moving



DIAGRAMMATIC SKETCH OF
EXCLUSIVE ROTOCURE PROCESS

—that's how ROTOCURE prevents OCS*—Achilles Heel of Conventional Belts!

"Start and stop" vulcanization (the conventional flat press method) can bump conveyor belt costs way out of line due to short life and constant replacements. Here's why: Press overlaps are *unavoidable* in this method of belt manufacture. They *result in overcured segments that weaken the belt.*

Why Rotocure-made Belts Are Superior to Flat Press

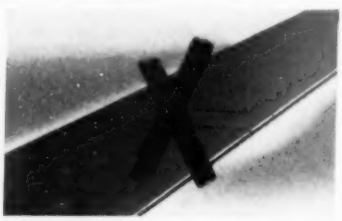
The BWH—pioneered method of ROTOCURE is a continuous, endless curing process of uniform belt advancement. Every inch of the belt is subjected to *identical* curing—in amount and in time. Thus weak segments due to overlapping are eliminated automatically by the process itself.

Why Rotocured Belts Should be on Your Jobs

The weak segments you *don't get* in BWH conveyor belts mean you *do get:*

1. Increased belt flex life—up to 40%.
2. Elimination of mechanical distortion at the press ends.
3. Constant, uniform stretch.
4. Uniform, abrasion-resistant covers.

For years, it's been an established fact among users that BWH Rotocured belts are "tonnage producers." If *you* want longer belt life, a good size dip in belt maintenance costs and savings per ton in materials conveyed ask your BWH distributor. He *knows* who's buying the values! Or write us direct.



*Overcured Sections-present every 30' to 40' in all belts made by the flat press method. Only Rotocuring (continuous, non-stop curing) eliminates this major cause of belt failures.

BWH
DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois **Distributors in all Principal Cities**

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

Barber-Greene

MODEL 363

PORTABLE CONVEYOR

Complete accessories are available to make the 363 Conveyor adaptable to the widest variety of operating conditions. It is shown here unloading a hopper car with a B-G 358 unloader.

HANDLES ALL MATERIALS: Sand, stone, gravel, wet concrete, chemicals, coal, etc.

UP TO 200 T.P.H. CAPACITY: Available in lengths of 25', 30' and 35', plain or cleated 24" belt.

NO CHAINS, NO SPROCKETS: Power transmitted from gear reducer through shaft to the head-end drive—sturdy, maintenance-free construction.

25 MILES PER HOUR TOWING SPEED: Pneumatic tires, coil springs, shock absorbers, convenient towing hitch.

RUGGED B-G CONSTRUCTION: Designed for maximum strength, minimum weight.

FULL SWIVELING WHEELS: For radial stockpiling as desired.

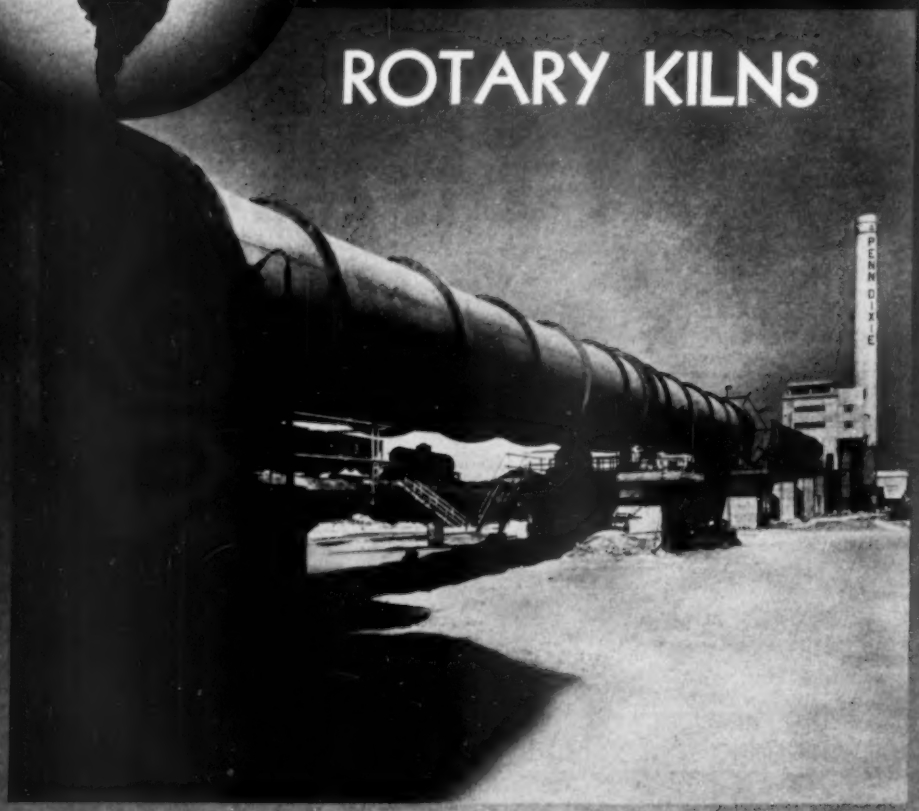
ALL PURPOSE: Built for contractors, material yards, concrete product plants; aggregate plants, gravel pits, City, County and State Highway Departments, etc.

SEE WHAT ONE MAN CAN DO...

BARBER-GREENE COMPANY
AURORA, ILLINOIS, U. S. A.

SMIDTH

ROTARY KILNS



Longest Rotary Kiln in the Western Hemisphere.
500 feet long, 12 feet in diameter.

Designed and Furnished by F. L. Smidth & Co.
for Penn-Dixie at Kingsport, Tenn.

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"WE HEAR..."

February, 1952

Contract awards for heavy construction for 1951, totaled $13,600.9 million, a 10 percent increase over 1950's total of $12,351.6 million, as reported by Engineering News-Record. Awards for public construction for the year totaled $6,167.2 million, 9 percent above the preceding year, while contract awards for private construction amounted to $7,433.7 million, an 11 percent increase over the $6,670.5 million for 1950. Industrial construction claimed the largest increase of the year; contract awards in this category totaled $4,119.4 million, a 145 percent gain over 1950.

Unclassified construction and public housing also showed strong gains during 1951, with contract awards for unclassified construction totaling $1,617.0 million, a 29 percent gain, and public housing awards totaling $644.0 million, a 79 percent gain. Other types of construction showing gains over 1950 were: sewerage, $334.6 million, a 16 percent increase; earthwork and waterways, $504.5 million, a 21 percent increase. Awards for private housing totaled $2,032.4 million, a decrease of 35 percent from 1950's boom level of $3,116.8 million. Commercial construction decreased 38 percent. Other classifications and their totals were: waterworks, $208.9 million, down 3 percent; bridges, $315.8 million, down 15 percent; highways, $1,167.2 million, down 8 percent; and public buildings, $2,057.3 million, down 14 percent.

* * * * * * * * * *

Gibsonburg, Ohio, police are looking for some husky thieves who recently stole between 400 and 500 concrete block one night from the Gibsonburg Cement Block Co. plant.

* * * * * * * * * *

Danish scientists have discovered a new use for concrete block. They have found that a more efficient production of yeast spores can be brought about by using concrete block as beds for the growing of the spores instead of the customary method of using gypsum block. The spores are grown in the pores of the block. The concrete block not only withstand sterilization heat, but also are said to give a better spore formation.

* * * * * * * * * *

According to estimates of the Bureau of Labor Statistics, more than one-fourth of all privately financed home dwellings started in 1949 were built by "non-professionals." Approximately 988,880 units were started by 400,000 firms and individuals with only 120,000 of the builders being commercially engaged in the building industry.

* * * * * * * * * *

At a meeting of the Electrochemical Society in Detroit, Mich., it was predicted that power shortages, similar to those now being experienced in the Pacific Northwest, may soon be experienced by Texas and the Great Lakes areas. The country is expected to face power shortages at least through all of 1952 and possibly into 1953. In the first 60 years of the industry (up to 1941), approximately 28,000,000 kw. of capacity were provided, but another 28,000,000 will be needed for the years 1951 through 1953, according to Clifford R. Beardsley, chief of the power requirements branch of the Defense Electric Power Administration. Shortages of steel, copper and aluminum are interfering with such expansion.

* * * * * * * * * *

According to figures released by Missouri Pacific Lines, the result of railroad operations in September, 1951, (first full month of the recent freight rate increase) compared with the same month of the previous year showed that ton miles of freight service were only about 3.7 percent less; operating revenue declined $16,000,000, or 1.8 percent; and operating expenses increased $59,000,000, or 9.7 percent.

WE HEAR

Purchase of two stone crushers for use by county towns was recently voted by the board of supervisors at Belmont, N.Y. The highways committee chairman stated the crushers could be used by 28 of the 29 towns in the county for processing stone for Erwin Law state aid programs. This is just one of many instances of government competing with private enterprise.

* * * * * * * * * *

The 11-month, 1951 total of construction awards in the 37 states east of the Rockies reached $14,516,792,000, an amount topping the previous record of $14,501,055,000 for the entire year of 1950, according to an F. W. Dodge Corp. report. However, the downward monthly trend in dollar volume of contracts continued with awards in November, 1951, totaling $931,768,000, representing an 11 percent decrease from October, 1951, and a 14 percent decrease when compared with November, 1950. Nonresidential awards in November, 1951, were $327,706,000, or 22 percent lower than the preceding month and 25 percent behind the November, 1950, figure. Residential awards of $443,884,000 were 11 percent lower than in October and 11 percent lower than in November, 1950. Public and private works and utilities of $160,178,000 showed a gain of 17 percent over October and 3 percent over November, 1950.

* * * * * * * * * *

The American trucking industry, during 1951, handled 137 billion intercity ton-miles of freight service, a 9 percent increase over the 126 billion reported for 1950. In terms of tonnage, this represents a 15 percent increase over the amount transported in 1950 which, in turn,was 25 percent above the 1949 figure.

* * * * * * * * * *

The National Production Authority denied applications on 2196 construction projects, totaling $505,278,733, for the fourth quarter of 1951, due to the shortage of controlled materials. The proposed construction, largely commercial in character, included projects in the United States, Puerto Rico and Hawaii. N.P.A. emphasized that applicants who have been turned down should refile for allotment in subsequent quarters, but warned that all less-essential construction will be cut back until the metals shortage eases.

* * * * * * * * * *

Monroe County, Ohio, commissioners have filed suit for $15,721.86 against two truck drivers for a ready-mixed concrete company. In their suit, the commissioners allege the truck was being driven over a bridge at too high a rate of speed and that the truck struck the bridge, causing it to buckle and collapse. Prior to the commissioners' suit, the truck drivers had filed suit against the commissioners for $1462.25 for damage to their truck and $15,000 for injuries received in the accident.

* * * * * * * * * *

A new method of plating worn sliding parts of industrial machinery with electrolytic iron at around a third less cost than if the parts had to be remachined and eventually replaced, has been developed by an eastern corporation which has a patent pending on the new process. The worn parts are immersed in a plating bath in which iron exists as positively charged atoms, or ions. With the immersed part as the negative pole, the iron from the solution combines atomically with the surface being plated. The pure, electrolytic iron is said to build up over the worn part evenly as to strength and to any thickness desired.

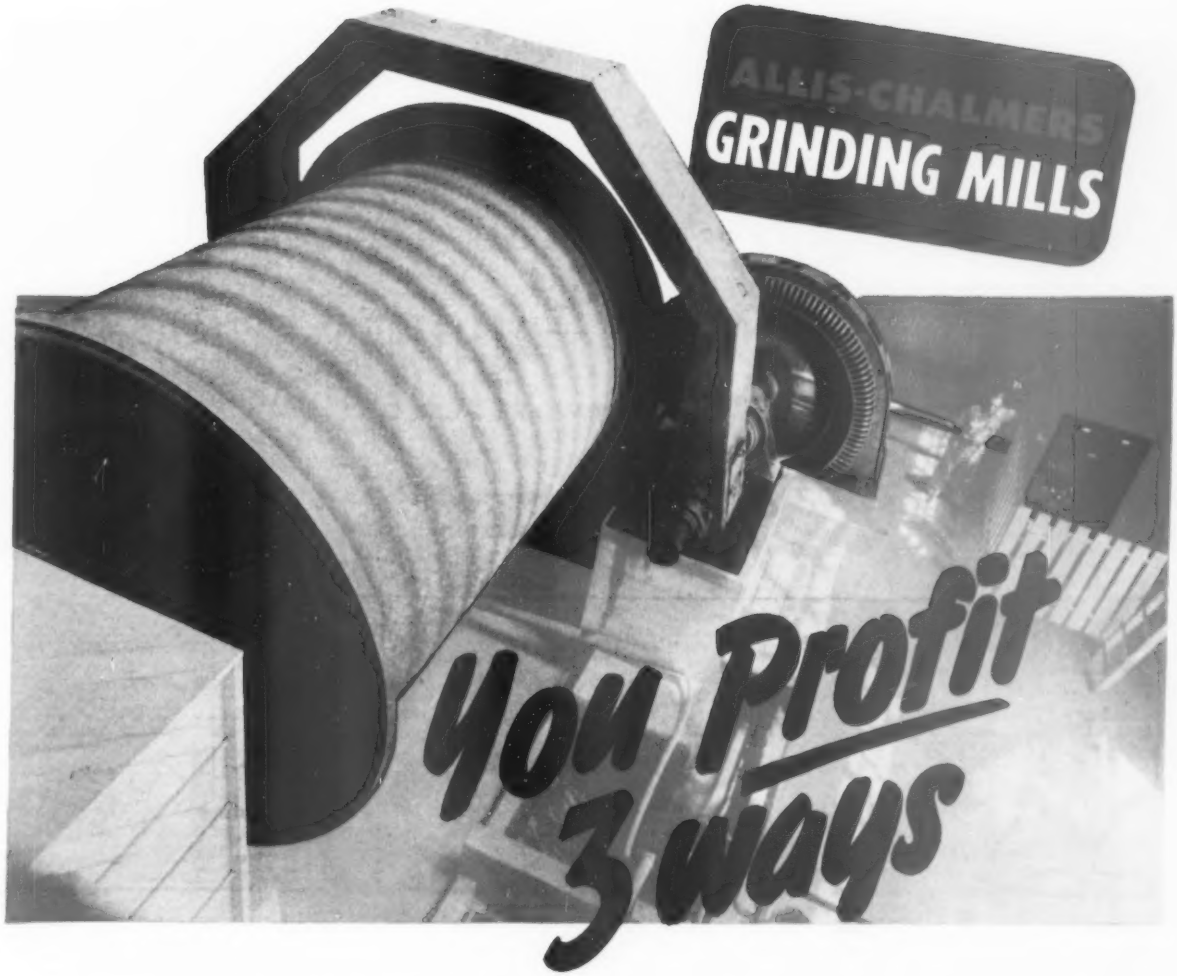
* * * * * * * * * *

A bill making $45,000,000 available for building defense roads and another bill, providing $15,000,000 for repair of highways damaged by floods, were recently passed by the Senate and sent to the House for approval. If the House passes the bill, $20,000,000 will then be made immediately available for contract. Approximately $5,000,000 is to be spent on road work in areas used for training the armed forces. The $15,000,000 appropriated for repairing of flood-damaged roads is an increase of $10,000,000 over the fund authorized in 1950.

* * * * * * * * * *

An item appearing in a recent issue of The Dragon (published by Dragon Portland Cement Co.) stated that federal tax collections from 1789 to June 30, 1945 (156 years) amounted to $248,348,394,590. This was compared with federal tax collections of $260,417,309,430 for the period from May 1, 1945 to June 20, 1951. In a little over six years, President Truman collected $12,068,-914,840 more than all his predecessors, including Franklin D. Roosevelt, collected in 156 years.

THE EDITORS



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1 **YOU CAN BE SURE** of getting a grinding mill specifically suited to your requirements. A wide range and multiple combinations of types and sizes assures this . . . assures top, economical performance year in, year out.

2 **YOU GAIN** the seasoned benefits and *unequalled* experience accumulated through the successful installation of more than 4200 Allis-Chalmers mills over a period of 70 years.

3 **YOU ARE DOUBLY ASSURED** of completely balanced operation, with its resulting economies, when you equip your mills with motors, drives and controls — all manufactured in A-C shops.

NEW 44-page grinding mill bulletin 07867184 is chuck full of valuable tables and grinding mill information. Get it from A-C representative in your area or write Allis-Chalmers, Milwaukee 1, Wis. A-3563

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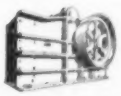
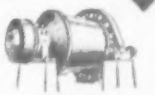
Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

Pulverator

Gyratory Crushers


Jaw Crushers


Grinding Mills

Vibrating Screens

Kilns, Coolers, Dryers

LOW Power Demand:

Grinding elements of the B&W Type B Pulverizer operate on the low-friction-loss, ball-and-race principle . . . which delivers large outputs with remarkably low power demand.

LOW Maintenance:

Wear is uniform and self-equalizing. Grinding elements, of wear-resisting alloys, are selected for long life and low maintenance.

LOW Housing Requirements:

Because of its compactness and high unit output, the Type B Mill permits much higher capacities in the same space . . . replaces other types without additional structure.

B&W is prepared to discuss your rock finishing requirements from first to final grind . . . a complete plant, including all auxiliaries . . . or any part thereof. The Babcock & Wilcox Company; 85 Liberty Street, New York 6, N. Y.

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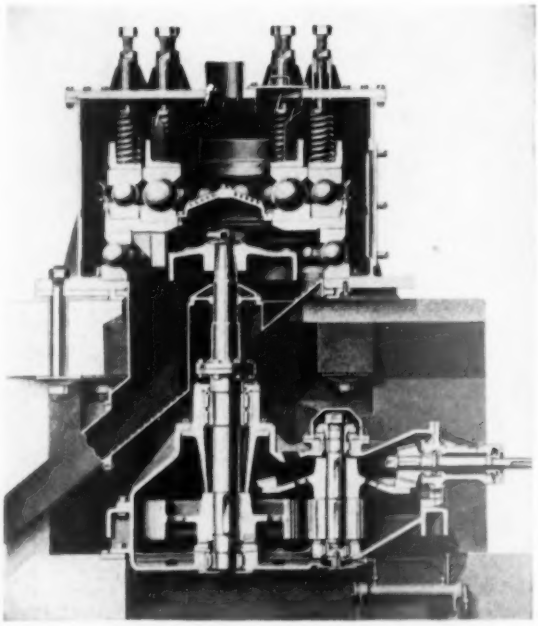

G-199

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MARION 191-M
10 cubic yards

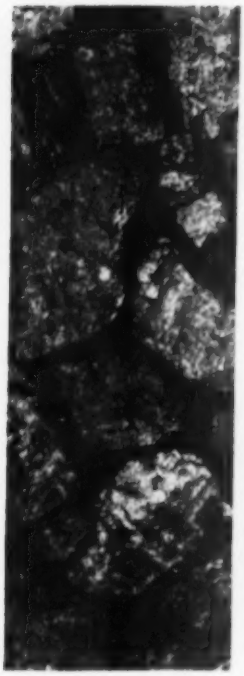
- Loads trucks in the 50-ton class in 3 or 4 passes to meet big haulage problems.
- Big enough to load gondola rail cars quickly.
- Greater travel speed and maneuverability than most of smaller machines.
- All-electric or diesel electric power; Ward-Leonard control on both.
- A 10 cu. yd. heavy-duty shovel with small-machine cycle time.
- Largest two-belt crawler shovel built.

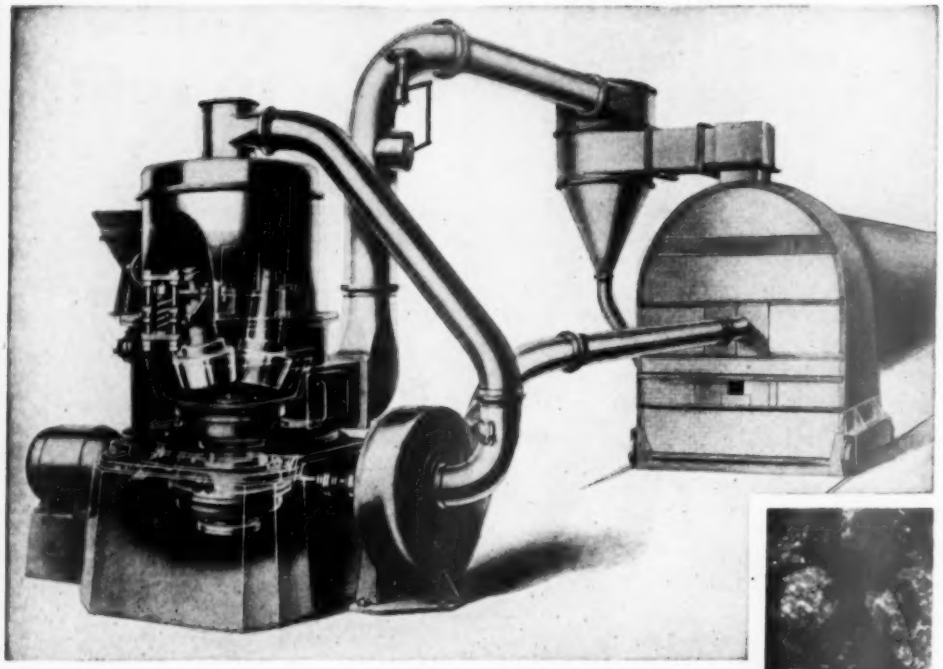
MARION POWER SHOVEL CO.
MARION, OHIO, U. S. A.

OFFICES AND WAREHOUSES IN ALL PRINCIPAL CITIES

from 3/4 cu. yd. to 45 cu. yds.

The "1952" Raymond BOWL MILL





Well over 260 Bowl Mills have been installed for kiln firing alone, since the first original unit went into operation in 1935.

This 17-year record has definitely proved the ability of the Bowl Mill to show consistent savings in the production of cement clinker, lime and dead-burned dolomite, while maintaining product quality of top specifications.

Continuous improvements are being made in design and construction, year after year. The "1952" Bowl Mill combines the latest engineering refinements and operating features. This modern direct-firing unit offers new advantages in coal grinding economy and kiln efficiency.

If you have a rotary kiln application, write us for further details of this automatically controlled direct-firing Bowl Mill system.

Raymond BOWL MILL Catalog No. 62 sent on request

COMBUSTION ENGINEERING

Raymond

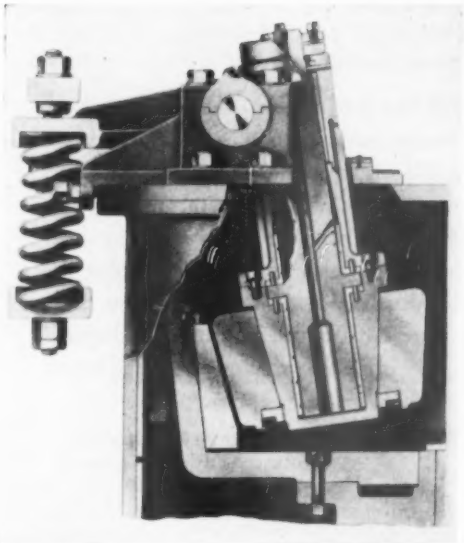
PULVERIZER DIVISION

—a Complete Modern System of Coal Grinding and Kiln Firing

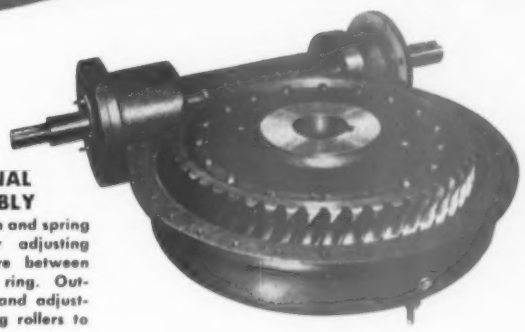
AUTOMATIC FEEDER
Specially built for the Bowl Mill. Feed rate regulated by adjusting speed of drive-mechanism . . . with indicator on panel board, optional.

CONTROL PANEL
Provides a complete operating picture of Bowl Mill and Kiln at all times. One or several mills may be controlled from single station.

Raymond FEATURES of BOWL MILL CONSTRUCTION



WORM GEAR DRIVE
Precision-built drive assembly gives long service life and smooth, quiet, vibration-free operation. Entire unit runs in bath of oil.



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Showing trunnion and spring mechanism for adjusting grinding pressure between rollers and bull ring. Outside lubrication and adjustment for aligning rollers to compensate for wear.

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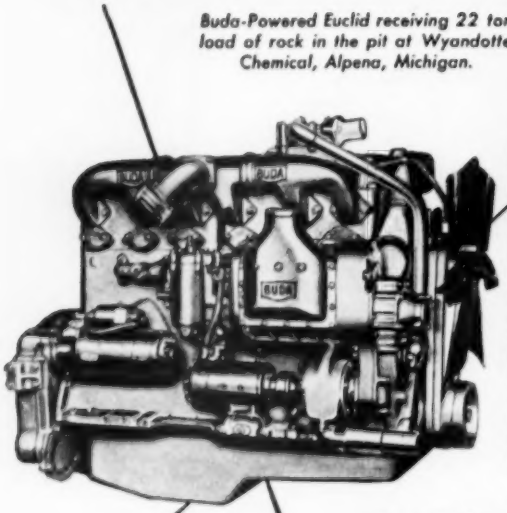

Buda-Powered Euclid receiving 22 ton load of rock in the pit at Wyandotte Chemical, Alpena, Michigan.

The Buda 844 Super Diesels powering Wyandotte Chemical Company's 14 Model TD-14 Euclid trucks averaged 17,280 hours of operation over a 4 year period without major overhaul.

Buda Diesels provide high travel speeds for faster round trips.

Dependability like that, coupled with low operating cost . . . minimum maintenance and less downtime make Buda Diesels a good bet for any operator. Buda Diesels are giving mine operators more horsepower hours per dollar . . . more power . . . greater lugging ability and faster round trips under the toughest job conditions. Ask your nearby Buda Distributor for details on Buda dyna-swirl Diesels' outstanding performance on mine hauls like yours. Write for Bulletins and data today.

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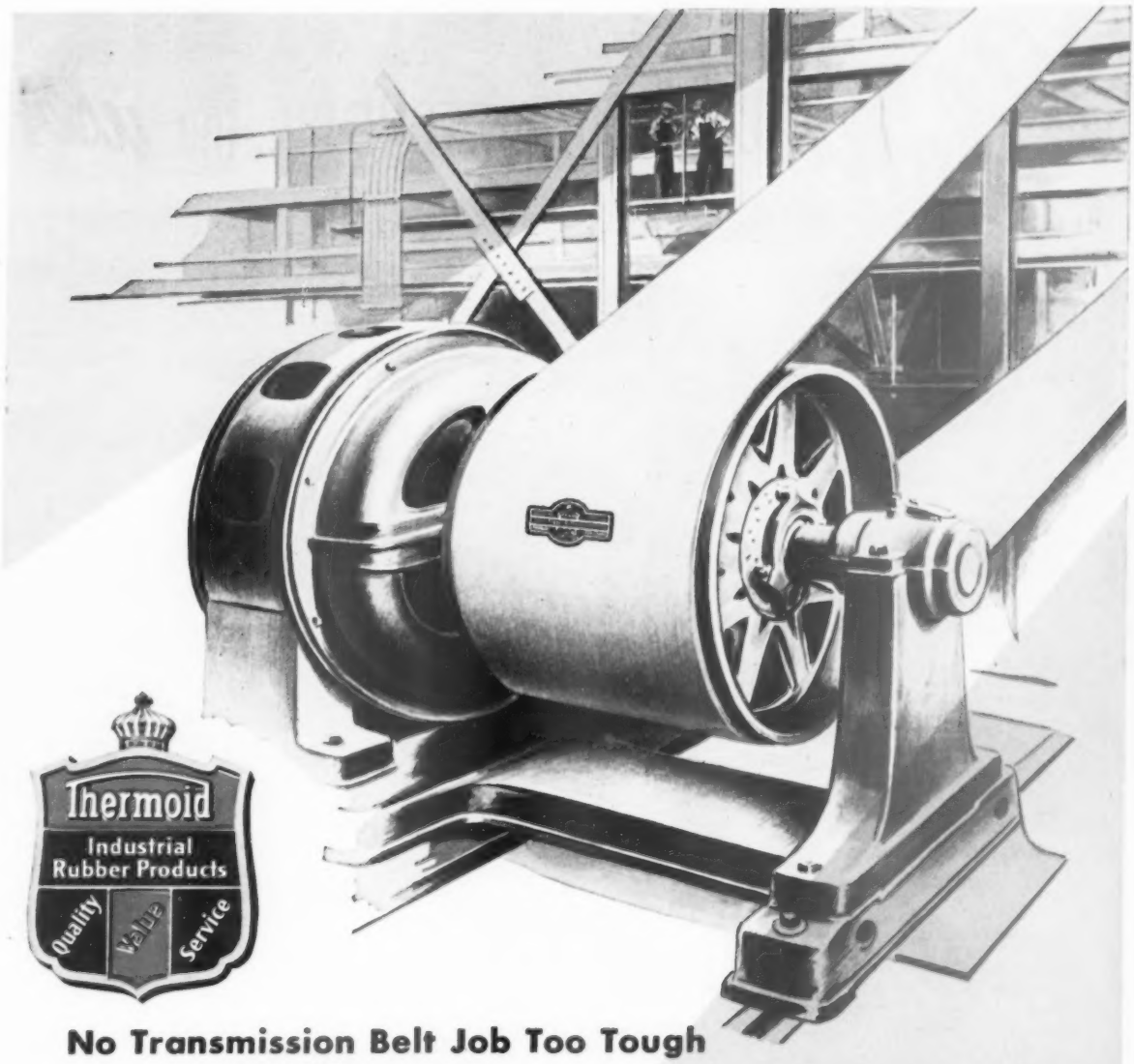

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For severe service, or for high speeds with small pulleys, he will recommend Thermoid High Speed "R", made with extra strong, hard 35-oz. duck and top grade rubber. Where there are oil or fumes injurious to rubber, he will recommend Thermoid High Speed "N", with Neoprene friction and skim. Each type is practically custom-built for the service for which it is recommended.

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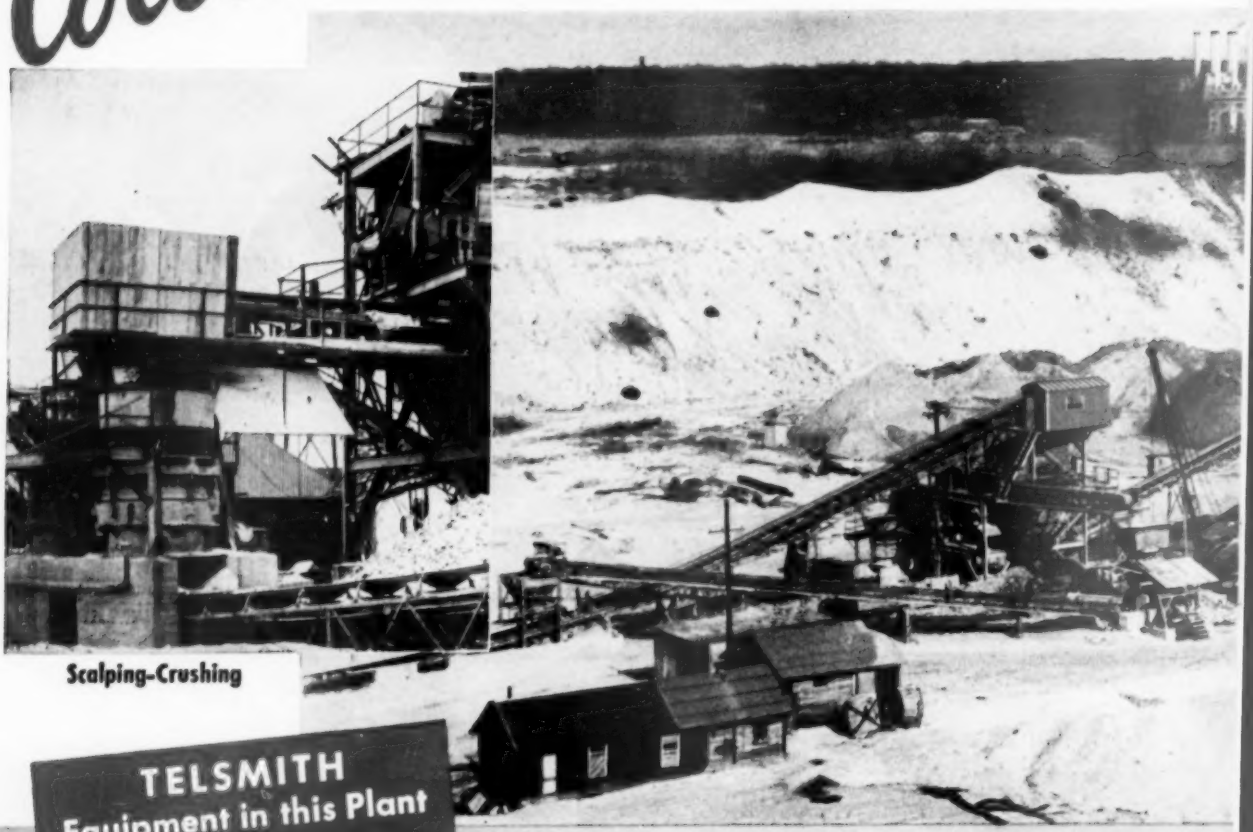

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TELSMITH Equipment in this Plant

Two 5′ x 14′ Two-Deck Heavy-Duty Scalping Screens

Two 48-S Gyrasphere Crushers

Eight 4′ x 10′ One-Deck Vibro-King Dry Screens

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Four 60″ x 9′ Super Scrubbers

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Fourteen Field and Plant Conveyors—18″, 24″, 36″, 42″ wide; total length about 3000′

Nineteen 24″ x 15″ Special Tunnel Gates

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● **COLONIAL of NEW YORK CITY and LONG ISLAND own and operate this modern all-steel sand and gravel plant. Designed in close co-operation with Telsmith engineers, plant layout and machinery is of the latest type, properly co-ordinated and balanced for flexibility and capacity, with interlocking features to assure smooth, trouble-free operation.**

Production averages about 1000-1200 tons per hr., making four kinds of material: minus 1½″ plus ¼″ crushed and uncrushed gravel mixed, minus ¼″ plus ⅛″ grits, minus ⅛″ sand, all washed; and minus ⅛″ dry sand. Most of the material is loaded into barges for shipment to New York. A truck-loading plant handles local demands.

In Scalping-Crushing Unit, two 2-deck Pulsators are in closed circuit with two 48″ Gyrasphere Crushers which reduce all gravel to minus 1½″. In the Dry Screening Plant eight special Vibro-King Dry Screens produce the dry sand. Scrubbing-Washing-Sizing Unit has two batteries of Vibro-King Wet Screens—two-deckers ahead, with single-deckers following the Super Scrubbers. Get Bulletin 266 describing Telsmith Complete Plant Service.

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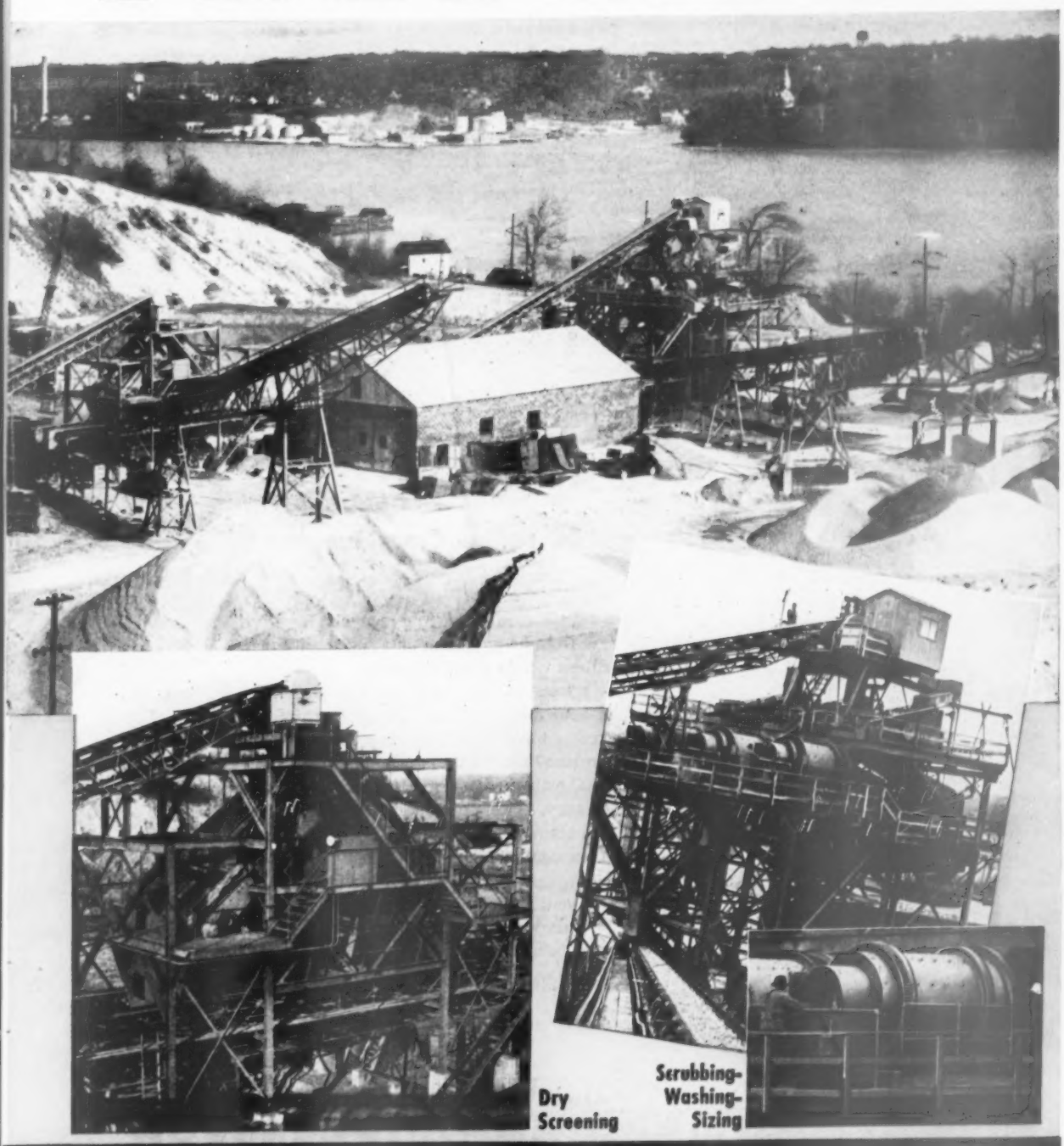

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Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

This 'dust' man is worth his weight in gold–to you

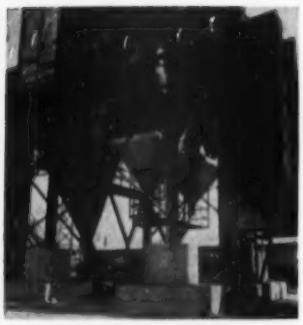
He can help you to new profit possibilities in the recovery of valuable escaping dust

There are still many industrial men who have yet to sit across the desk from an industrial dust engineer—a man who may be actually worth his weight in gold to you.

If you are one of these men, you have a revealing half-hour in store—a half-hour that can mean new profits…improved product and/or process…top over-all efficiency.

The reason? Buell's staff of industrial 'dust' men draw on more than 200 man-years of experience in the design and construction of high-efficiency, trouble-free Dust Recovery Systems. You will learn of the success of hundreds of Buell Installations. You will learn how one can be designed for you.

For full information about Buell Dust Recovery and Dust Collection Systems, write today. Ask for the new illustrated Buell 'Dust Recovery' bulletin. It can be a highly profitable move. Buell Engineering Company, Dept. 17-B, 70 Pine Street, New York 5, N. Y.



Buell van Tongeren Cyclones with the exclusive "Shave-off" provide high efficiency in the collection of kiln dust.

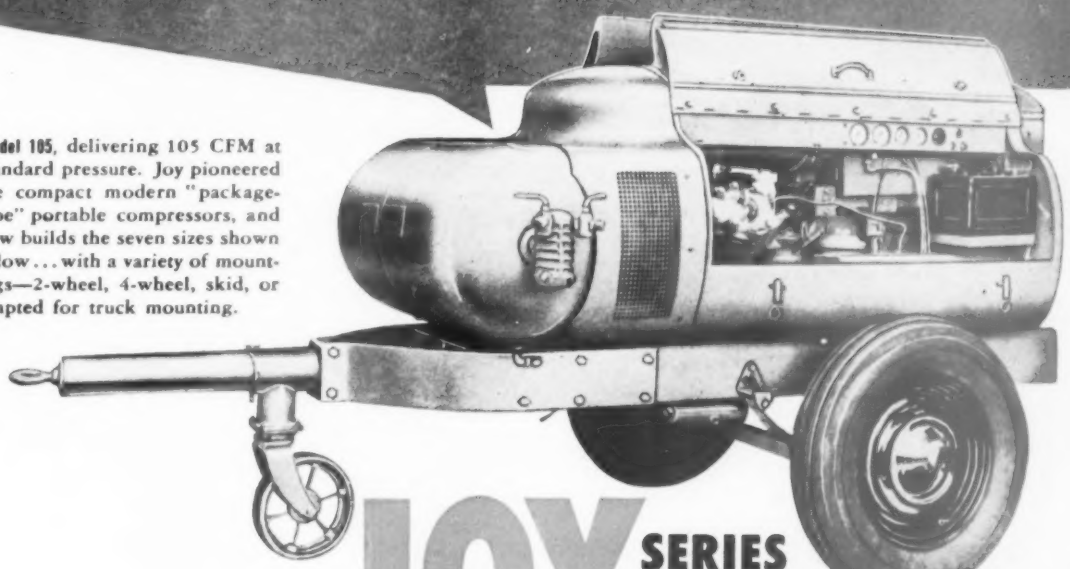
ELECTRIC CYCLONIC · buell

HIGH EFFICIENCY CYCLONES • ELECTRIC PRECIPITATORS
TYPE 'LR' COLLECTORS • LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS • DUST HOPPER VALVES

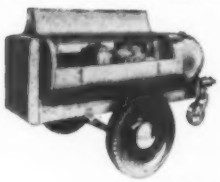
ENGINEERED EFFICIENCY IN ***DUST RECOVERY***

Here's *Portable* AIR POWER at Lowest Cost and Topmost Efficiency

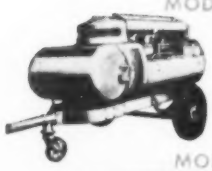
Model 105, delivering 105 CFM at standard pressure. Joy pioneered the compact modern "package-type" portable compressors, and now builds the seven sizes shown below... with a variety of mountings—2-wheel, 4-wheel, skid, or adapted for truck mounting.



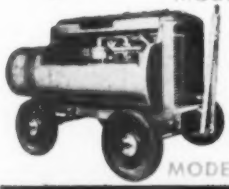
JOY SERIES 80 PORTABLE COMPRESSORS



MODEL 60



MODEL 160



MODEL 210

Compare these Features!

- ★ 2 STAGE COMPRESSION
- ★ AUTOMATIC "ECONO-MISER" LOAD CONTROL
- ★ SEVEN SIZES—60 TO 630 CFM
- ★ NOTHING TO MATCH THEM FOR MODERN, COMPACT DESIGN—PORTABILITY—RELIABLE AND EFFICIENT OPERATION

WRITE FOR BULLETINS!

W&D C 2074

MODEL 315

MODEL 500

MODEL 630

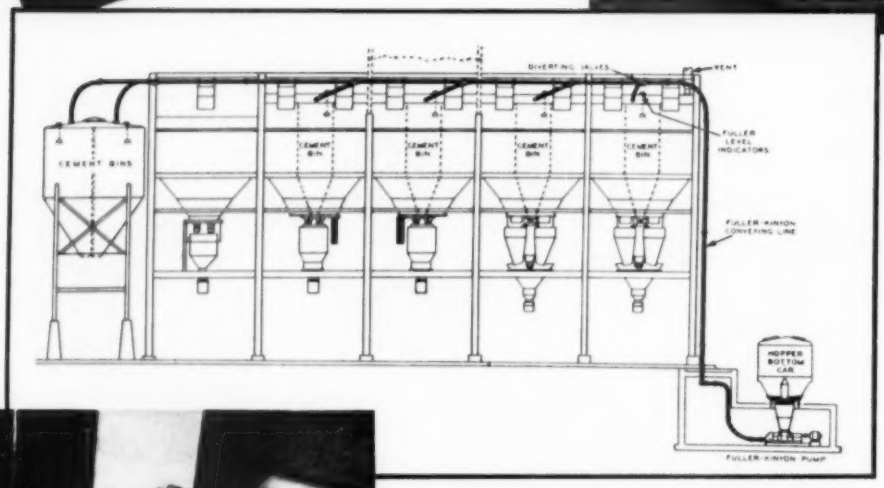
Consult a Joy Engineer

JOY MANUFACTURING COMPANY

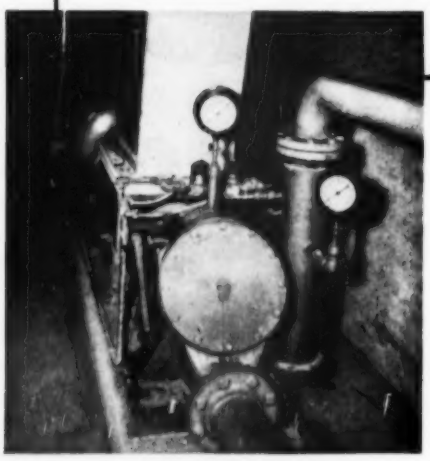
GENERAL OFFICES: HENRY W. OLIVER BUILDING · PITTSBURGH 22, PA.

IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

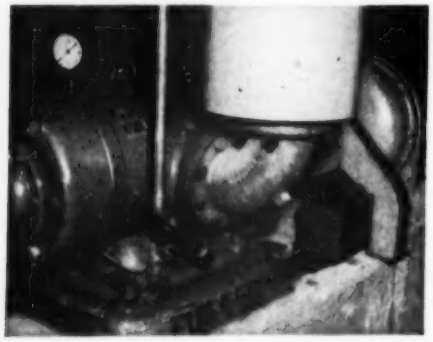
Fuller-Kinyon System
An outstanding feature in an outstanding plant



Multiple-station batching plant. Note cement conveying lines to the various bins.



Fuller-Kinyon Stationary Pump in pit under track.



Fuller Rotary Single-stage Compressor, which furnishes air for the conveying system, 482 c.f.m., 20-lb. pressure.

One of the ready-mixed concrete plants put into operation during 1950, the Iron City Sand & Gravel Corporation at Pittsburgh, Pa., selected the Fuller-Kinyon Conveying System for handling bulk cement. It is reported that the cement storage and conveying system is one of the important features of this modern plant.

Bulk cement is received by rail or truck and discharged to the hopper of a Fuller-Kinyon Pump. This pump conveys, at the rate of 125 barrels an hour, to one main storage bin of 800 barrel capacity, divided into two compartments of about one carload each, and four additional 200 barrel storage compartments built into the center of each four-compartment aggregate bin.

The Fuller-Kinyon System delivers to six points—one at each of the four 200 barrel compartments in the aggregate bins, and two at the 800 barrel bin. The valves for these points of discharge are operated from a walkway above the bins. Automatic bin controls sound an alarm and shut off the pump whenever the bin into which it is discharging is full. The operator can start or stop the pump from a central-control panel board, which controls the handling system for all aggregates.

A Fuller-Kinyon System may be readily installed without interrupting production or interfering with existing structures or equipment. It's safe, clean, simple, and economical. Why not have a Fuller engineer make a survey of your conveying problem? His findings and recommendations may well open your eyes to an entirely new concept of conveying.

Fuller

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS AND ASSOCIATED EQUIPMENT

FULLER COMPANY, Catasauqua, Pa.
Chicago 3 • 120 So. LaSalle St.
San Francisco 4 • 420 Chancery Bldg.

P-131

Her fingertips imagine the taste

The lady doesn't trust her eyes alone.

The buyer of Multiwalls is in much the same position.

Aside from package design, it's hard to tell one manufacturer's bag from another's simply by looking at it or fingering it.

Put the bags out of sight and you may be able to see many differences.

Men who buy 85 per cent of all Multiwalls consider* these intangibles more important than any other factor when they choose their supplier.

Invariably, these are among the first questions they ask . . .

"Is this company big enough?"

"Do they have a fair allocation policy?"

"Are their prices competitive?"

"Do they respect delivery dates?"

In a nutshell—

"Are they good people to do business with?"

We can't tell you what the answers are when these Multiwall users consider Union. This we do know . . . and the inference is yours to make—

In these days of industrial pressure, when *dependability* is a fervent wish as well as a word, men to whom Multiwalls are important are placing an increasing share of their orders with Union.

More so every day . . .

IT'S UNION FOR MULTIWALLS

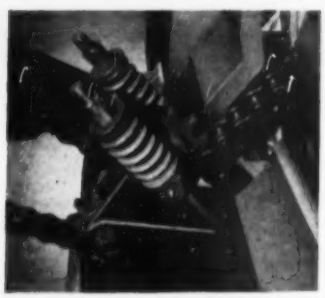
TRADE MARK UNION

*August, 1951 research study.

UNION BAG & PAPER CORPORATION • NEW YORK: WOOLWORTH BUILDING • CHICAGO: DAILY NEWS BUILDING

CHECK THESE FEATURES

- ✓ Fully Convertible
- ✓ Long, Wide Crawlers
- ✓ Alloy Cast Bases
- ✓ Tandem Drums
- ✓ Power Dipper Trip
- ✓ High Line Speeds
- ✓ Wide Vision Cabs
- ✓ Pin-Connected Boom



Automatic crowd chain adjuster.

the lifetime cost of a BAY CITY SHOVEL . . . on the basis of yards and tons handled . . . *is amazingly low*

While it is true that BAY CITY equipment has always been moderately priced, it's the low yearly lifetime cost that pays off. Scores of BAY CITY machines have records of 20 to 25 years or more on the job. No single factor makes BAY CITY shovels and cranes so long-wearing—so long-lasting. It is a combination of heavy-duty design and construction features that contribute to the extremely long life of BAY CITY equipment.

The BAY CITY Balanced Design plus the many operating and maintenance advantages have been engineered with bigger value and dependable performance. For stability the long, wide crawlers. For low center of gravity the one-piece heat-treated alloy-steel cast bases. For alignment the mounting of engine and all machinery on a full length base. Get complete information from your nearest BAY CITY dealer—write today for catalog.

BAY CITY SHOVELS, INC., BAY CITY, MICH.

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

FOR TOUGH TONNAGE

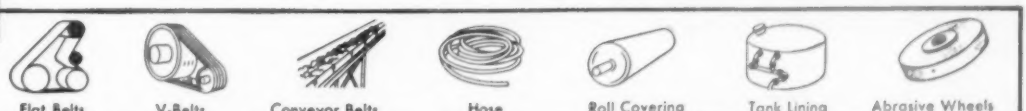
Homocord CONVEYOR BELT

"We pay more for Homocord, but it costs us less!" • That's what users say . . . and they won't take any other conveyor belt. It makes sense, too. Where tonnage is toughest, Homocord has been known to outlast 2 or 3 ordinary conveyor belts. Figure cost of belts, plus cost of repeated installations, and Homocord proves the biggest bargain you can get • Its special construction—cushioned and flexible—absorbs impact that other belts can't take. Send for Bulletin 6906 and read about the Guillotine Test that proves our point • The same engineering goes into our hose, V-belts and flat belts. Get your Manhattan representative to show you.

R/M

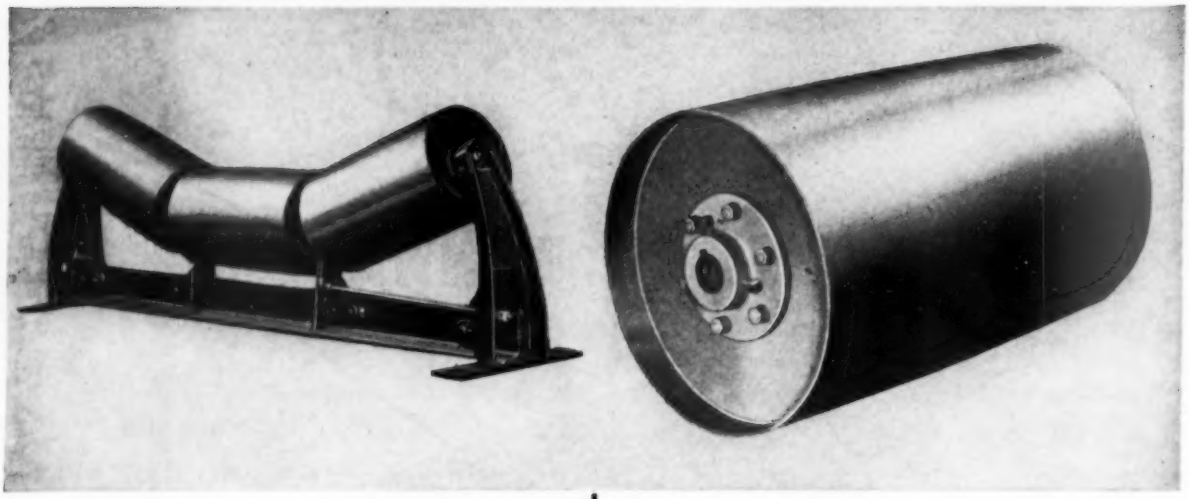
MANHATTAN RUBBER DIVISION—PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.



Other R/M products include: Industrial Rubber • Fan Belts • Radiator Hose • Packings • Brake Linings • Brake Blocks Clutch Facings • Asbestos Textiles • Sintered Metal Parts • Bowling Balls

How Belt Conveyors by LINK-BELT
cut your handling costs



LINK-BELT Idlers require minimum lubrication and adjustment

BY MINIMIZING maintenance . . . holding "down-time" to a new low . . . reducing power requirements — Link-Belt Roller Bearing Idlers save you money.

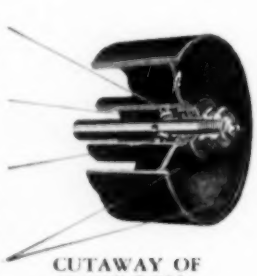
And, because of standardized design, Link-Belt gives you the famous "100" Idler or the heavy-duty "200" Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths. A complete line to meet any requirement.

Grease-in dirt-out, cartridge type unit seal preserves lubricant. No springs, no loose parts, no sliding metal-to-metal contact.

Large grease reservoir prolongs lubrication intervals.

Precision roller bearings maintain alignment.

Concentrically counterbored and journaled full-length central tube and counterbored roll shell are continuously welded to dished heads to maintain balance and bearing alignment.



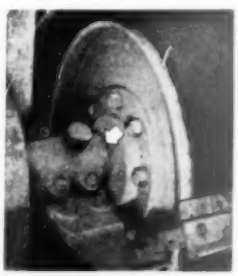
CUTAWAY OF "100" ROLL

LINK-BELT Welded Steel Pulleys minimize shaft deflection

MODERN Link-Belt welded steel design gives you lower maintenance and longer pulley life in more ways than one. Water- and dust-tight construction preserves balance, halts corrosion. Removable hubs — key-seated in line with two set-screws — are interchangeable with many other shaft sizes.

And for reducing shaft deflection (see below), you can't possibly get better protection than with Link-Belt Welded Steel Pulleys.

Since shaft bending moment increases in proportion to the distance between shaft bearing and pulley hub, it's easy to see why Link-Belt Welded Steel Pulleys are your best bet. Note how the bearing support and hub of the pulley are mounted with medium clearance. That's possible because Link-Belt hubs are flush with the pulley face.



BELT CONVEYORS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12.534

LINK-BELT

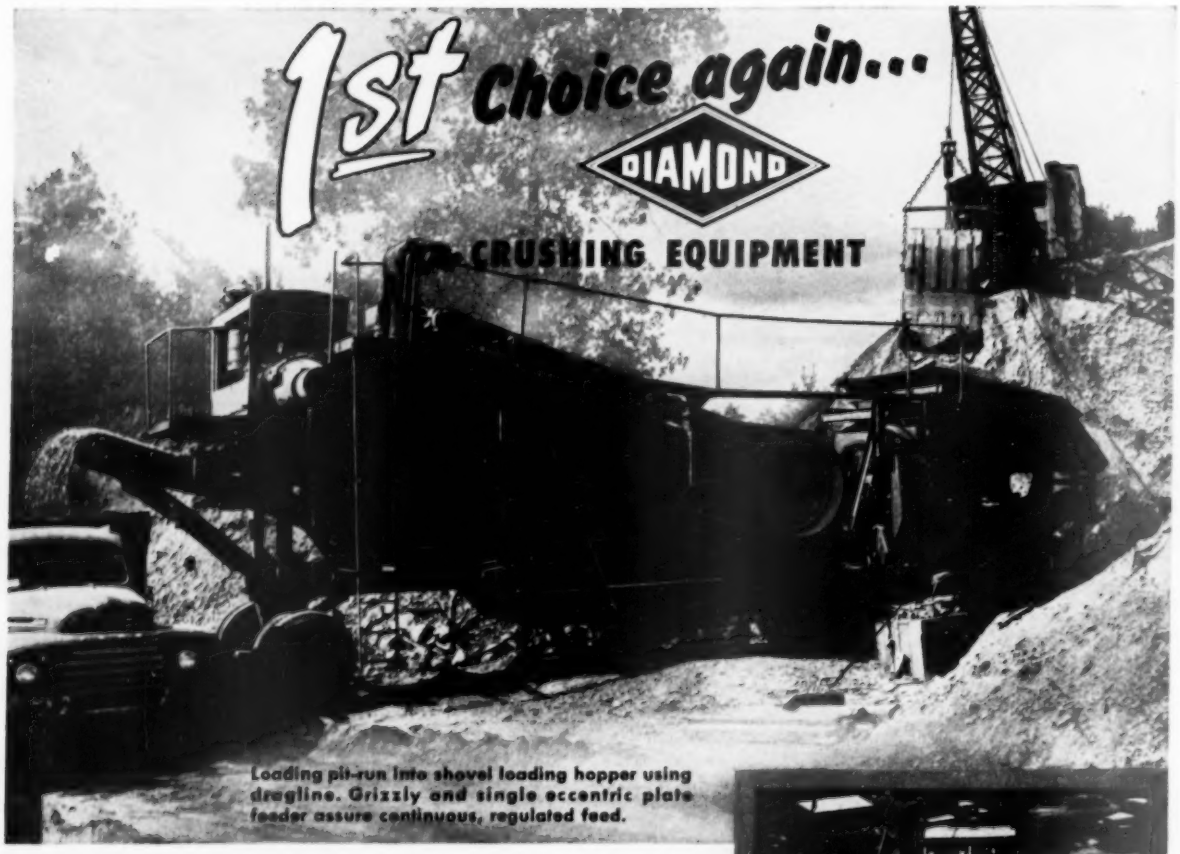
This Lippmann GRIZZLY KING Jaw Crusher at Alabama Aggregate Company, Pelham, Alabama, has crushed 1,200,000 tons of tough Blue Ridge rock since it was installed. Discharge opening is 5 inches. The management reports that this tremendous output has been attained without interruptions — that the reversible jaw dies have not been touched, not even reversed.

No other jaw crusher can match GRIZZLY KING'S capacity and performance. Extra-long curved and reversible jaw dies, engineered crushing action with alloy steel frame and jaw add up to the rock-eatingest crusher on the market today. The GRIZZLY KING is the world's highest capacity overhead eccentric jaw crusher and is available in sizes up to 36" x 48" opening.

Other Lippmann equipment at Alabama Aggregate includes an apron feeder and discharge belt conveyor with Lippmann Life-Sealed Ball Bearing Idlers. Leading operators the world over choose Lippmann for their crushing, screening and washing plants both stationary and portable. It will pay *you* to do so too. Lippmann Engineering Works, 4005 W. Mitchell St., Milwaukee 14, Wisconsin.

LEW LIPPMANN

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS



Loading pit-run into shovel loading hopper using dragline. Grizzly and single eccentric plate feeder assure continuous, regulated feed.

NAGELKIRK & RANTA enter aggregate field

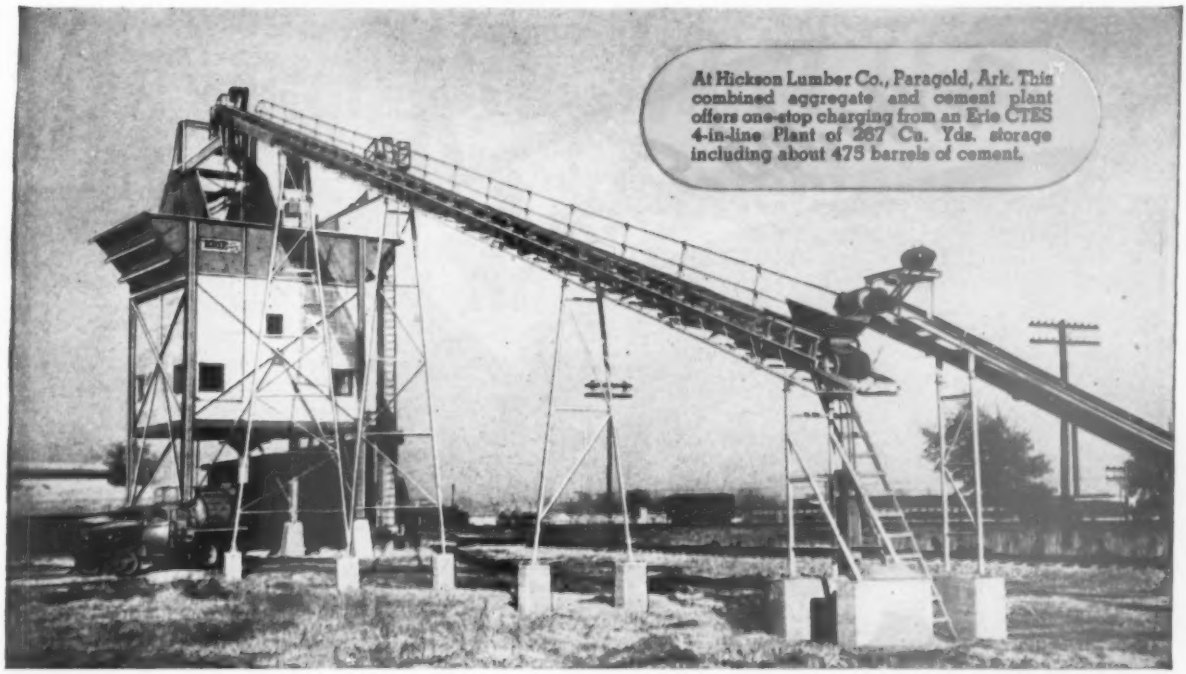
FIRST CHOICE OF NAGELKIRK & RANTA, Grand Rapids, Michigan dirt contractors, when they recently went into aggregate production, was a Diamond "66" Rotor-Lift plant. Crushing and screening gravel for Michigan road construction, Nagelkirk & Ranta are producing approximately 150 tons of 30 per cent crush specification material hourly. Like many other contractors, Nagelkirk & Ranta appreciate the quick set-up and knock-down of Diamond portable crushing equipment . . . the all-round portability possible.

DIAMOND'S "66" PLANT has a 10″ x 36″ jaw crusher, 30″ x 18″ roll crusher, and 4′ x 10′—2½ deck vibrator screen.

Built to keep you in business . . . at a profit!

Diamond equipment shortens material flow, jumps output, gives you more for your money. Crushing, screening, washing and loading of rock, gravel, aglime and concrete aggregates are best done by Diamond. Before you specify or buy . . . see your Diamond distributor. Or write for illustrated literature.

Diamond "66" plant at Nagelkirk & Ranta job site near Grand Rapids, Michigan. Note power unit installed over delivery conveyor for accessibility and easy travel. Power unit need not be removed when on road.



At Hickson Lumber Co., Paragold, Ark. This combined aggregate and cement plant offers one-stop charging from an Erie CTES 4-in-line Plant of 267 Cu. Yds. storage including about 475 barrels of cement.

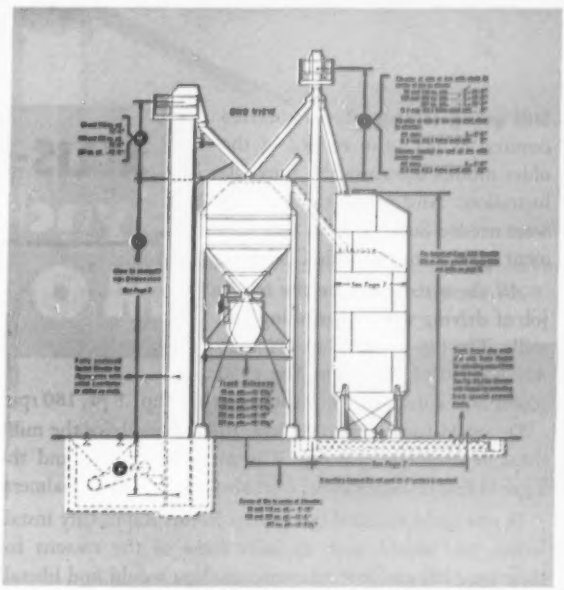
ERIE C-S SERIES *Combination* BINS

Offer 10 Compartment Arrangements

These Combination Aggregate and Cement Bins are of the knock-down semi-portable type. We build them in standard sizes with either 3 or 4 compartments in line. To meet special storage conditions we also build C-S Combination bins in 10 different top partition arrangements that provide almost any degree of material classification.

The advantage of having up to 475 barrels of cement alongside aggregates in one bin makes for economy and fast one-stop charging of materials. Auxiliary connected cement storage may be provided by the addition of Ground Storage Bins.

For extra high truck clearance required of large Central Mixing Plants or Concrete Products Plants 11 ft. additional column height, over the standard 20 1/3 feet, is available.

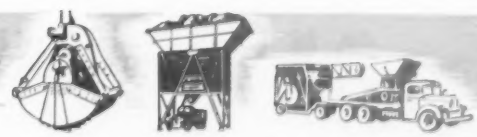


Arrangement of Erie C-S Series Combination Cement and Aggregate Bin with auxiliary Erie Silo-type ground storage of cement interconnected to main plant.

WRITE FOR BULLETIN C-S

ERIE
STEEL CONSTRUCTION COMPANY

722 GEIST ROAD • ERIE, PENNSYLVANIA



Still going strong after a quarter century. That's the record of the older motors shown in the above illustration. And when more motors were needed South Dakota State Cement again turned to Allis-Chalmers.

ALLIS-CHALMERS Synchronous MOTORS

All these motors have the tough job of driving wet raw grinding ball mills. The two installed in 1924 are 400 hp, 1.0 pf, 180 rpm. The 1950 motor and a duplicate not shown are 350 hp, .8 pf, 180 rpm.

Designed for low starting kva, the motors drive the mills through magnetic clutches. The mills themselves and the Type H full-voltage starters were also built by Allis-Chalmers.

If you could examine the motors in this Rapid City installation, you would soon discover some of the reasons for their long life and low maintenance. You would find liberally proportioned bearings for trouble-free operation. You would find field coils securely supported and protected by adequate pole collars. And you would find many other important features.

But there would be many features you would not be able to see. You wouldn't see the testing that assured satisfactory steel for the stator laminations. Nor the precisely controlled processing that results in long insulation life. Nor any of the many ways in which each motor is engineered to fit its specific application.

We suggest that you get a copy of our illustrated Bulletin 05B7648. In a few minutes, this *new* bulletin will show you why you'll be money and years ahead with Allis-Chalmers low-speed pedestal-bearing synchronous motors on the job. Ask your nearby A-C representative for a copy, or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3533

ALLIS-CHALMERS A-C ALLIS-CHALMERS

Typical "Nitramon" blast gives splendid fragmentation in stratified limestone quarry

1. Face of southern limestone quarry shows boulder-like formation at top with badly folded and stratified rock pitching 50°. Shots must be carefully planned to shear the bottom and maintain proper floor level.

2. Loading Du Pont "Nitramon"* in well drill holes for blast presents no problem . . . provides maximum safety. Note preparation of "Nitramon" Primer in background.

DU PONT "NITRAMON" is ideal for quarry blasting. It's safe. It's convenient. It's easy to load and packed in watertight metal containers. It saves time and helps lower over-all quarrying costs. The Du Pont Explosives representative in your area will gladly give you complete information about "Nitramon" . . . the safest blasting agent known. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

*Registered trade-mark for nitrocarbonitrate blasting agent

3. Shot was fired with holes going at milli-second intervals to create "peeling action" and reduce vibration.

4. Excellent fragmentation produced by "Nitramon" blast reduces secondary blasting to a minimum. Spreading action of Du Pont "Nitramon" shears the bottom and keeps the floor level where it belongs.

DU PONT "NITRAMON"

DU PONT
REG. U. S. PAT. OFF.

A Product of Du Pont Explosives Research

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

NO WARPING, LESS DOWNTIME

with Segmental Kiln Ends Cast in Thermalloy

These segmental kiln ends designed by Electro-Alloys will lengthen kiln life, reduce downtime, and greatly speed replacement. Records show kiln ends lasting as long as 15 years, thanks to the protection against warping provided by these heavy-duty Thermalloy ends.

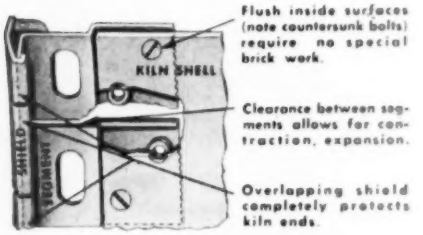
INSTALLATION IS EASIER because there's no special brick work needed. Segments are fastened with bolts countersunk on the inside of the kiln, eliminating any need for special brick work and providing a perfectly flush surface for the brick lining.

WARPING IS GREATLY REDUCED because, (1) segmental design allows for expansion and contraction without permanent set of the kiln shell, and (2) segments completely shield kiln ends from clinker and flame leakage to a depth of 16½" back from the mouth of the kiln. Yet you don't shorten the effective operating length of the kiln.

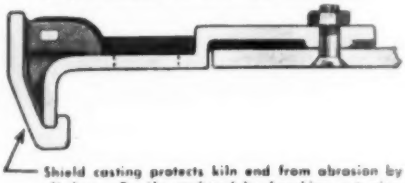
ONE-MAN REPLACEMENT is made possible with segmental design; the maximum weight to be handled at any one time is 35 lbs. Shield segments—which bear the brunt of flame leakage and clinker abrasion—can be removed by simply knocking out the pins which secure them, and replacing with new shield.

LENGTHEN SERVICE LIFE OF YOUR KILN next time you're replacing or installing a kiln end—let one of our engineers show you how we can lengthen its life for you. Simply write Electro-Alloys Division, 2141 Taylor St., Elyria, Ohio.

VIEW FROM INSIDE KILN


KILN SHELL
SHIELD
SEGMENT
Flush inside surfaces (note countersunk bolts) require no special brick work.
Clearance between segments allows for contraction, expansion.
Overlapping shield completely protects kiln ends.

Kiln is protected by high heat resistant Thermalloy, to distance of 16½" back from mouth.

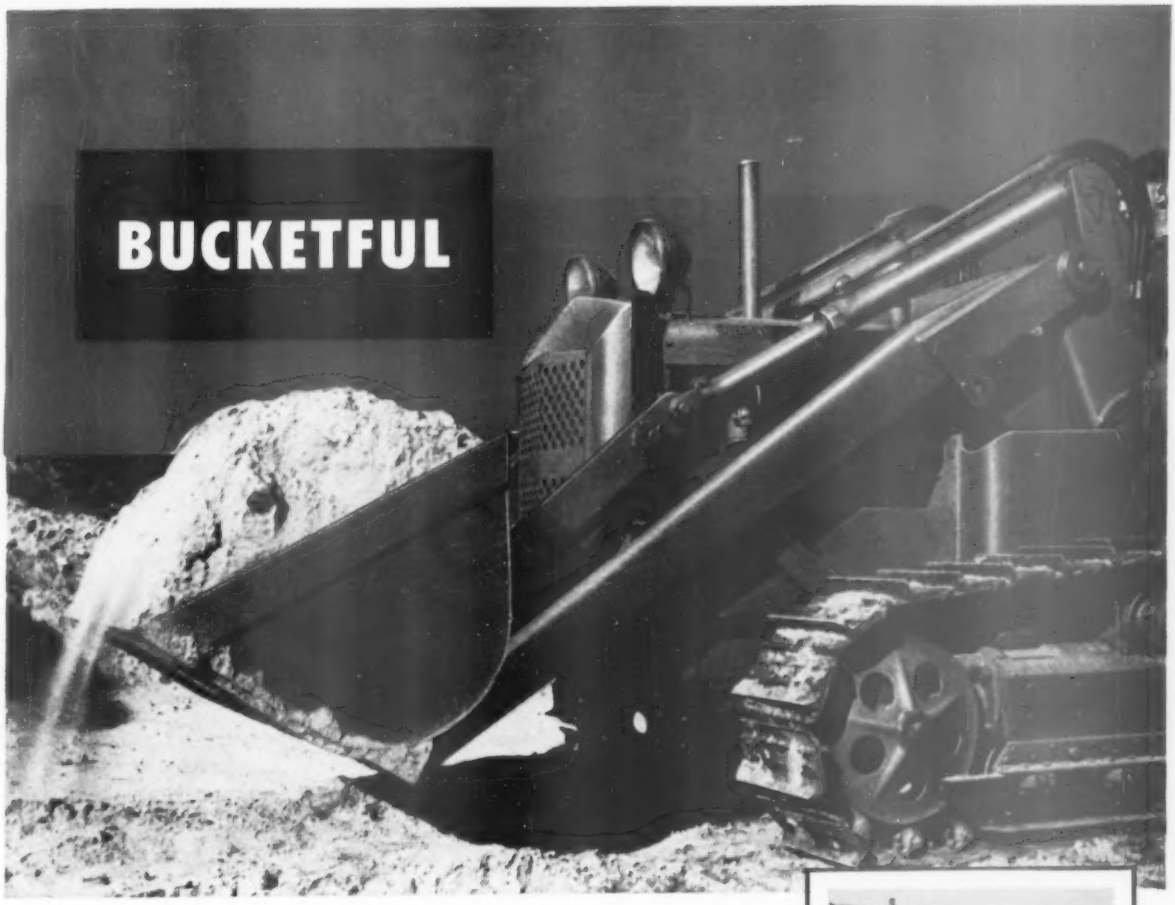


Shield casting protects kiln end from abrasion by clinker. Easily replaced by knocking out pins.

*T. M. Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO



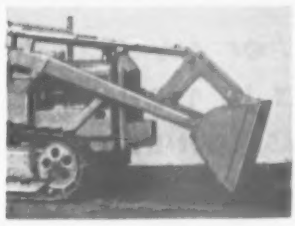
# of Cost-Cutting Features

When it comes to cutting loading costs... stepping up profits, the Oliver Model "B" Crawler and Ware Loader is "loaded" with *plus* features.

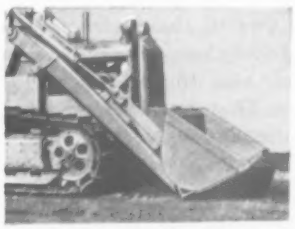
Take the hydraulically controlled bucket, for example. 110° bucket rotation and 28° "tilt back" give you a full bucket every time. "Breaking out" action is 3 times the lifting effort of the loader... a particularly important advantage when loading out hard-packed material or for stripping operations. Bucket level is automatically maintained when lifting load, preventing wasteful spillage. You can control speed of discharge... fast or slow, easily and gently. And, even with the "tilt back" action, you still have a 32° (from vertical) dump angle... a control range no other loader can match. You get bigger loads... *faster!*

The Oliver-Ware "B" loader was designed and built exclusively for Oliver Model "B" tractors. Its ideal fit with the tractor eliminates unneeded dead weight and assures maximum stability for the entire unit. The Oliver semi-rigid axle allows limited oscillation of the track, eliminating the possibility of track-frame distortion. A hydraulic shock absorber smooths out pressure surges... prevents damage to loader and tractor parts.

For complete information on how the Oliver-Ware Model "B" tractor loader can cut costs for you, see or write your Oliver Industrial Distributor.



Plenty of power, plus the wide angle of bucket rotation, assures faster, more positive digging. 28° "roll back" assures maximum break-out action for a full bucket every time.



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*Editor's page.....

Action Is Required NOW to Get Steel for Highways

RECENT STATEMENTS and actions by high N.P.A. officials, in refusing equitable allocations of steel for highway construction, raise doubts as to the competence and possibly even the motives of those who hold the whip hand in Washington. Shortage of steel available to highway builders is the one single thing that is threatening paralysis of our highway system.

At the recent Governors' Conference in Washington, governors and other top officials representing 45 states were unsuccessful in prying loose a single concession from N.P.A. Manley Fleischmann, who heads that agency, made it clear that highway modernization and construction are not considered essential to the national defense effort. It has also been stated from the top that steel will be released for highways that "threaten to break down" but that none would be allocated for four-lane through roads.

As a result of this arbitrary attitude, the allotment of structural steel for the second quarter of this year is less than 30 percent of screened minimum requirements, which isn't even enough to complete essential defense projects already underway.

Discrimination

Highways rank sixth from the bottom on a list of 40 activities for which steel is being allocated which ranks highways as no more important to the defense effort than the motion picture industry. After satisfying the requirements of top priority defense activities, policy is to grant each other activity on the list a little steel rather than allocate greater quantities to the more important activities at the risk of complaints from the others. There is no quarrel with allocations of steel for defense requirements but highways are not receiving fair allotments of steel based on relative essentiality.

If highways are not essential, there just isn't anything in this country that is, outside of the military and war production. Without adequate highways we could never produce our war requirements, for highways must carry the greatest proportion of freight, including war materials, and the workers to their jobs as well.

Mobilization officials do not seem to have grasped the changed pattern of our economy and they certainly do not understand the condition of our roads when they say that steel will be allocated for highways that are likely to break down. Most of our highway mileage was built in the 1920's to have a life expectancy of 15 to 30 years.

We have added 11 percent to our paved, all-weather mileage since 1945 but the number of automobiles and trucks has gone up by 68 percent to a total of 52,000,000 vehicles. Automobile manufacturers are getting most of their steel requirements and are building faster cars. Cars like the new 190-hp. Cadillac were built to travel 100 m.p.h. and their drivers will try to do it over roads built for half that speed. Neither were those roads designed for the modern rubber-tired freight cars that are crushing the life out of them. Many of them carry unrestricted loads for the war effort.

Need for Action

The federal government may feel paternalistic because it has contributed highway funds but its contributions are a drop in the bucket compared to expenditures of the states which seek to protect their taxpayers' investment.

It is pure waste for the states to patch roads that have deteriorated as much as many have. And what about the millions of dollars a day wasted in production, and in time and effort by all of us, through plain congestion? Isn't it worthwhile to save some of the 5000 lives that will be added to last year's toll because roads are inadequate? Insurance rate increases this past year prove that highway users are no longer a good risk.

Because reports on the availability of structural steel are confusing and because we may have an indefinite "emergency" it is timely to determine if the international situation justifies sacrifices of the magnitude imposed on the highway industry. Psychological considerations, if they exist, should be ferreted out from realities in re-examination of the steel supply.

Arbitrary action of the N.P.A. suggests that steel allocations have reached the political level. All highway interests including the aggregates industries, which have a vital stake in highways, should take steps *now* to make it clear to their Congressmen that their constituents demand a decent highway program in the public interest. If curtailment of substantial markets does not serve the defense effort, concerted action stemming from the grass roots is the course of action dictated. Straight reasoning is getting nowhere.

Bror Nordberg

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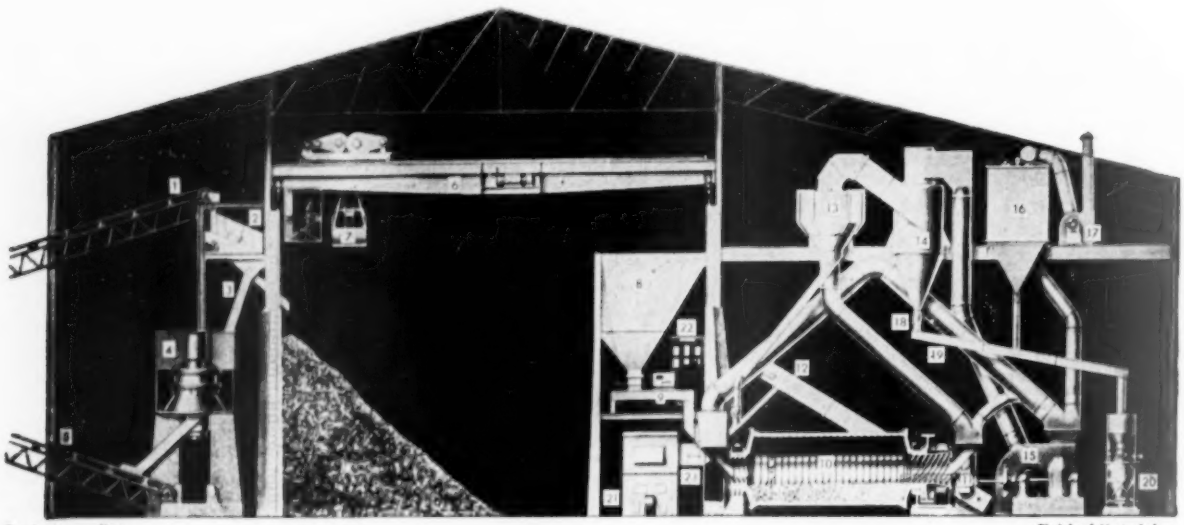
lowers grinding costs...reduces power

consumption...cuts maintenance costs



*patents pending

Finished Material to Storage Silo

1 Belt conveyor — feed to crusher
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6 Traveling crane
7 Clamshell bucket
8 Mill feed hopper
9 Weighing feeder
10 Stratified air swept tube mill
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13 Radial flow classifier
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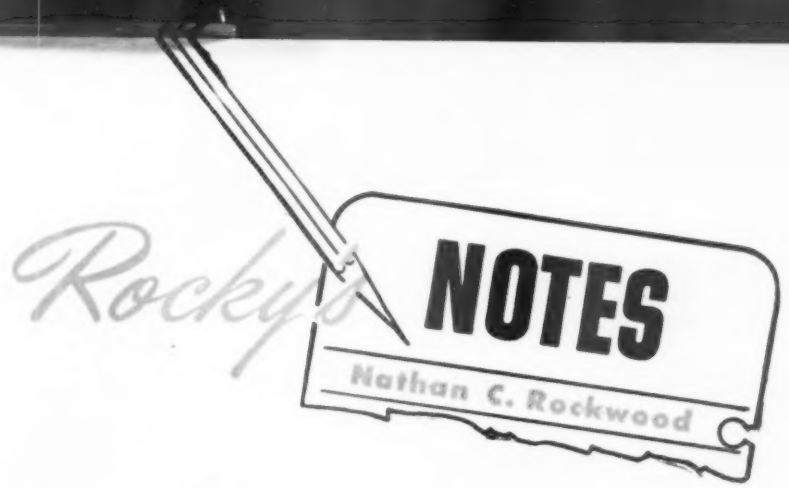


Occasional Checks on Administrative Law!

SO MANY WARNINGS are heard about imminent loss of American liberties, and the seriousness of "this year of decision," that we all can derive a little comfort whenever evidence crops up that there still exist some safeguards. One lies in the wisdom of our forefathers, who in drafting the Constitution, made the federal judiciary independent. While justices and judges of questionable ability and capacity are appointed from purely political motives by the executive department, the courts on the whole still remain our last and best defense against a power-grasping administrative bureaucracy. Every man in business today has had some experience with laws and regulations, made not by his "lawful representatives in Congress assembled," but written, interpreted and enforced by this growing army of bureaucratic administrators, usually ignorant of the complexity of business and industry and also apparently careless of the fundamental constitutional rights of citizens.

During the past year we had occasion in the pages on "Labor Relations Trends" to record recent attempts of the administrator of one of the wage-and-hour laws, in the U. S. Department of Labor, to crack down on alleged violators of the Walsh-Healey (Public Contracts) Act, several years after the alleged violations, and notwithstanding the fact that the value of the contracted materials involved was less than the $10,000 limit defined in the law itself. Presumably the Congress fixed the $10,000 limit because it did not want to waste the time of high-salaried bureaucrats in running down picayune cases. Some years later, the Congress woke up to the tremendous handicaps to doing any kind of business under such laws when there was no fixed time limit within which the aggrieved employes or the government had to act. The result was passage of the Portal-to-Portal Act, which in clearing up other ambiguous and controversial points, set a limit of two years in which to collect wages and penalties under the Fair Labor Standards Act and Walsh-Healey Act.

The cases of two agricultural limestone producers, who the U. S. Department of Labor had held were violators of the Walsh-Healey Act, are given in detail in the May and November, 1951, issues of ROCK PRODUCTS. These small producers failed to state in their bids to the U. S. Department of Agriculture that they would not accept orders in excess of $10,000 on these particular bids. Presumably, in cases where the total business was to exceed the $10,000 limit, the better informed producers have made successive new bids or contracts, no one of which was for more than the $10,000. We know that other departments of the federal government regularly made such arrangements with producers of construction materials, where contracts for purchases had to be made direct, and producers did not desire to put themselves under the Walsh-Healey Act provisions, which require time-and-a-half pay for all hours over eight *in any one day*, regardless of the number worked per week, as well as time-and-a-half for over 40 hours a week.

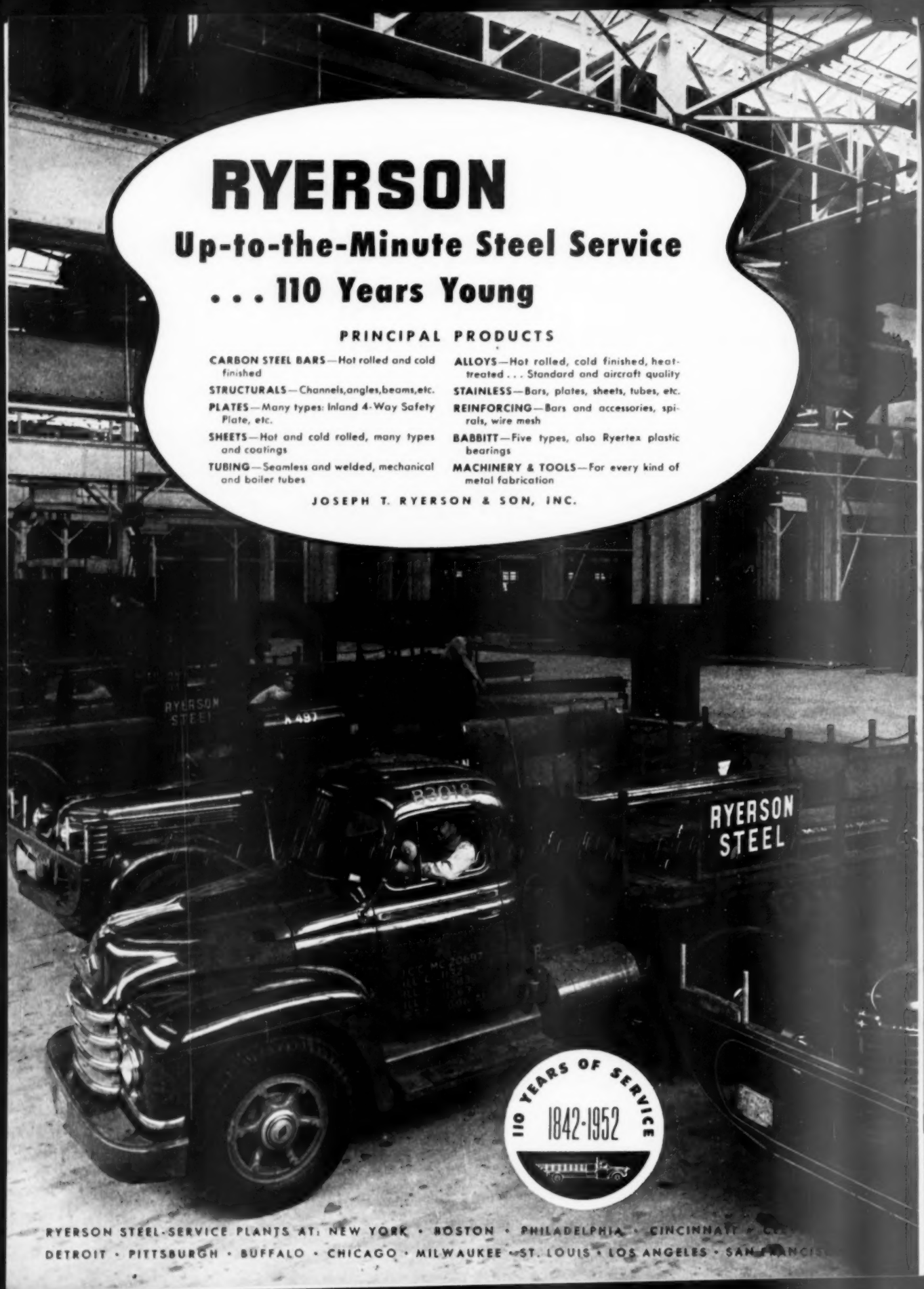
In both cases the alleged violations took place more than two years before the Labor Department acted, in one instance, the producing plant had even changed hands in the interim, but the Labor Department took the stand that the Portal-to-Portal Act establishing the statute of two-year limitation did not have the usual interpretation when applied to the federal government in a suit to collect the "liquidated damages." The department did not attempt to collect back wages for employes, allegedly due. The liquidated damages, however, are the estimated value of the unpaid overtime wages, but it is the government, not the workers, who collects them. Not only did the Labor Department examiners make their own arbitrary decisions about this interpretation of the Walsh-Healey Act itself, but they made equally arbitrary rulings on who and what types of employes should be considered in arriving at their estimates of the liquidated damages. We published those details at some length not so much because there may be other possible violations in kind, as to demonstrate this high-handed method of dealing with citizens.

In both cases the amounts involved were relatively small. We do not know whether the producers submitted to the administrator's decisions and paid their assessments without further protest or appealed to the United States Courts as they could or can do. There were, however, two producers in other fields who would not accept the Labor Department's rulings, went to court, and they have won an important decision, which will prove encouraging to all government contractors who may be similarly situated. One of these cases was United States vs. Lange, which was carried to the U. S. Court of Appeals for the Fourth Circuit (Richmond, Va.) and the other was United States vs. Lovknit Manufacturing Co., decided in the U. S. Court of Appeals for the Fifth Circuit (New Orleans, La.). On December 11, 1951, the U. S. Supreme Court denied petitions by the Labor Department for writs of certiorari, which means that the decisions of the two lower Courts of Appeals stand. These decisions will put a serious crimp in this kind of administrative law interpretation and enforcement.

Statute of Limitations Applies

In the Lange case, the Labor Department won judgment in the U. S. Circuit Court for the Western District of North Carolina, but the decision was reversed by the Court of Appeals on the same grounds as held by the Court in the previous case of the Lovknit company, which was cited as authority. The Lovknit case was decided in favor of the Labor Department by the U. S. District Court of the Northern District of Texas. However, the defendant appealed, and one of the points he made was that the statute of limitations applied, even to the government's suit, contrary to the Labor Department's contention that the two-year time limit did not begin to accrue until the department's examiner had determined the violation. The Court of Appeals upheld the defendant. It quoted the plain language of the law (Portal-to-Portal Act) which says that unless the action is begun within two years after *the cause of action, every such action shall be forever barred.*

The only point decided by the Court of Appeals was that this prohibition referred to action by the government to recover liquidated damages for itself as well as action by the employes to recover allegedly unpaid wages. Specifically the Court said (in part) "that the failure of the Secretary [of Labor] to have an earlier hearing and findings, if he wished them, is no excuse for delaying the suit, and that it was filed too late and was 'forever barred' in the emphatic language of the limiting act." Prior to this decision the Labor Department had obtained a series of District Court decisions upholding its view on the beginning of the limitation period as the time of its own finding of law violation.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LABOR RELATIONS TRENDS

Health and Welfare Plans Under W.S.B.

By NATHAN C. ROCKWOOD

WE HAVE MENTIONED in previous articles on this page the drive of the union bosses for more fringe benefits wholly at the expense of industry employers, in addition to, if possible, or perchance in lieu of, unlimited wage hikes. The original viewpoint of the majority on the Wage Stabilization Board was to view these as equivalent to wage rate increases, since there is no question that they have the same effect in increasing the labor costs of production and distribution. Considered in this aspect it was of course necessary for the board to make some regulations to prevent runaway inflationary forces from this cause, which incidentally illustrates how complicated all economic controls become when once started by a government bureaucracy.

After several months of cogitation the W.S.B. has come up with General Regulation No. 19, which covers the policy adopted to govern the establishment of new plans and the amendment of existing plans providing for health and welfare benefits, which include temporary disability, hospital expense, surgical expense, in-hospital medical expense and death benefits on a group term basis, including accidental death and dismemberment benefits. This policy and procedures which will be used in carrying it out are set forth in this regulation and in W.S.B.'s Resolution No. 78. The resolution sets up a review criteria, with which proposed plans must be compared to be accepted. As was to be anticipated the majority of the board leaned heavily on the demands of organized labor and gave scant attention to the arguments of its industry members, although it claimed to follow "a middle course."

What of the Future?

The unanimous dissent of the six industry members of the board was directed to the "virtual decontrol of health and welfare plans" for these reasons: (1) increases in payroll costs will result in an inflationary spiral of higher prices; (2) the so-called regulation will cause a shift from employe contributory to non-contributory plans, which in effect is a further wage increase and creates more inflationary pressure; (3) violates the board policy of preserving historical relationships for collective bargaining and is contrary to the concept of area or industry practice and is contrary to the concept of historical development of our nation's economy; (4) the heedless use of these plans in the present tight labor market, which will be largely paid for out of taxes or government contract funds, will result in a chaotic condition when many of these plans will have to be cut back or abandoned after defense production is curtailed; (5) absorption of these payroll costs by the employer if not passed on in increased prices will result in reduction of net taxable income and will further inflate the economy through reduction of Treasury income and more borrowing; (6) divert billions of dollars to insurance and trust company treasuries, which will flow back into the money market with broad inflationary impact; (7) opposed to a national pattern which will interfere with free collective bargaining and saddle industry with permanent social legislation, created only to meet an emergency.

The six labor members of the board objected because in their opinion the health and welfare plans should be entirely decontrolled. They objected also to inclusion of employe contributory plans, because "workers have taken to picket lines in defense of the principle that the full cost of health and welfare plans should be paid by management." Their idea was also that all the members of their families should be included in these plans at the employers' expense. This objection is aimed, as the reader will see in what follows, at the requirement that workers contribute 40 percent of the cost of such family coverage. The labor members concluded their statement with the promise to continue political pressure on the board to accept their point of view, regardless of the present regulation.

The six public members of the board, who are the ones actually responsible for the Regulation No. 19 as now promulgated, decided that: "These health, welfare and pension benefits in general do not constitute payments which in fact compensate workers for increases in the cost of living. Nor do they add to the purchasing power of workers and thus to inflationary pressures. These benefits are a form of saving and to that degree are non-inflationary. Furthermore, it is difficult to evaluate the cost of these plans accurately in terms of dollars and cents. Such an attempt would only result in confusion."

General Regulation No. 19

The regulation provides that plans which are within the definitions of Regulation No. 19 will receive automatic approval on their submission to the board on a prescribed report form. "If, however, a plan, or a portion thereof, varies from the definitions or contains a feature listed among the criteria, the party or parties must so indicate on the prescribed report form. Such a form shall thereupon automatically constitute a petition for board approval of such plan or portion. Such a plan or portion thereof cannot be put into effect unless and until the party or parties received notification from the board that the plan has been approved."

The following details are covered in the regulatory provisions, complete text of which can be obtained by application to the board or to any of its regional offices:

(1) Plans providing temporary disability hospital expense, surgical expense, and in-hospital medical expense benefits;

(2) Group life insurance and accidental death and dismembership benefits;

(3) Coverage for dependents of employes;

(4) Extension of existing plans;

(5) Plans required under federal or state law;

(6) Procedure for establishing new or modifying existing health and welfare plans which conform to the definitions and do not contain any feature listed among the review criteria;

(7) Procedure for establishing new, or modifying existing, health and welfare plans which do not conform to the definitions or contain any feature listed among the review criteria;

(8) Tripartite Health and Welfare Committee set up to pass upon proposed new or revised plans;

(9) Relationship to other regulations and resolutions;

(10) Definition of "plan;"

(11) Plans in effect on or before January 25, 1951 or thereafter approved by the board;

(12) Recision of Board Resolution No. 67.

Review Criteria—Resolution 78

When any portion of a health and welfare plan contains one or more of the following features, such portions of such plan, or the entire plan, where necessary, shall be referred to the Health and Welfare Committee (of the board) for action in accordance with Section 6 of General Regulation No. 19. This section describes in detail the procedure for establishing new or modifying existing plans.

The review criteria are as follows:

(a) *Temporary disability*

"(1) The existence of any provision for paid sick leave.

"(2) Continuation of benefits for a maximum duration in excess of 26 weeks.

"(3) In the case of illness payments, a waiting period of less than seven days.

"(4) Compensation for wage loss, which for the group of insured employes as a whole, averages more than 60 percent of the average weekly wages, salaries, and other compensations of the insured employes.

(b) *Hospital expense*

"Any unusual type of benefits, e.g., special nursing; full payment for

(Continued on page 142)

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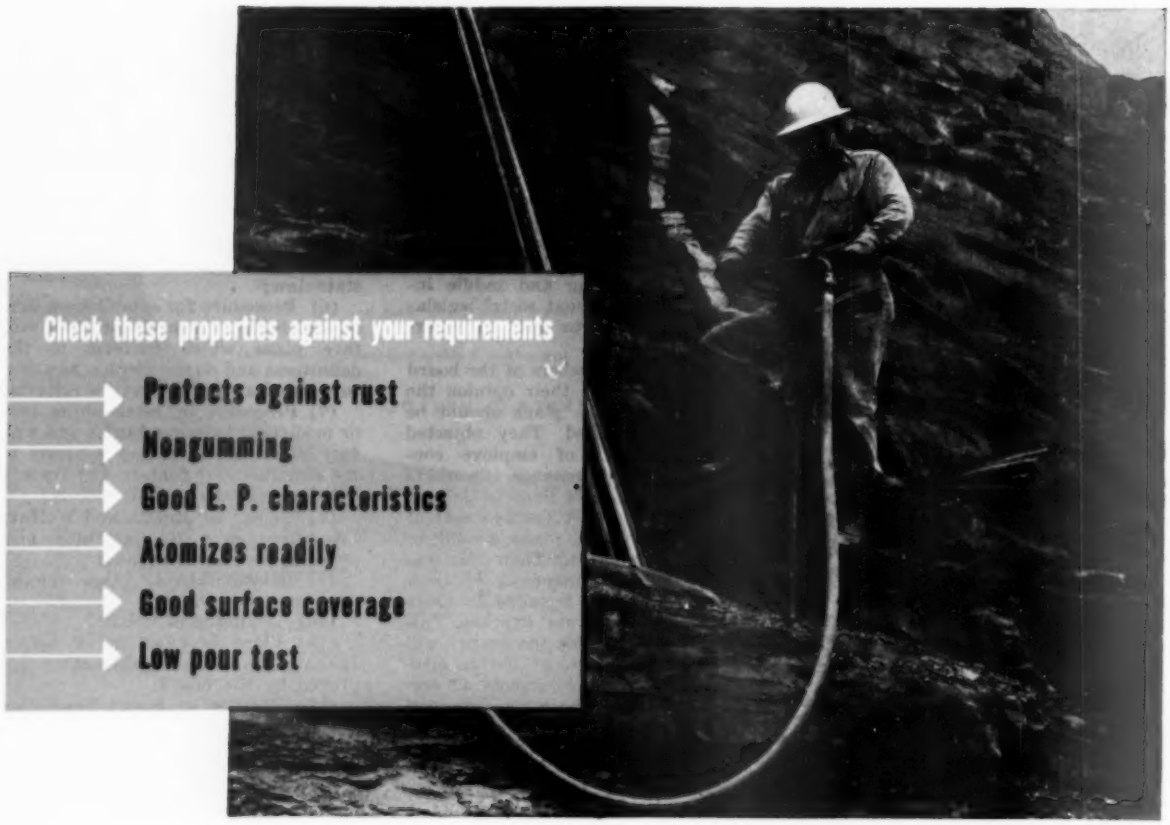

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GULF INDUSTRIAL LUBRICATION

PEOPLE in the news

N.A.L.I.'s First President

ROBERT M. PATTON, who was elected president of the National Agricultural Limestone Institute at its first annual convention in January, 1952, is well-

Robert M. Patton, president-elect of National Agricultural Limestone Institute

fitted to lead the way toward building a strong, unified association. Bob is 37 years of age (he looks more like 29) but has plenty of experience and a record of accomplishment already behind him that is surprising for a man of his age.

In accepting the presidency, Bob was sincerely modest in saying that a "boy was put in a man's job," but that actually is far from the truth. He has a wonderful background in the rock products industries and he is a dynamic individual who has the necessary initiative and drive to spark the growth of the association to new heights.

Bob is a graduate of Rutgers University where his major studies were mining, mechanical engineering and political science. He later attended the Business and Finance College of New York University. He has been with his company, now known as the New York Coal Sales Co., Columbus, Ohio, since 1941 except for a leave of absence of four years in the Army Air Corps where his principal activities were in the maintenance of ground equipment.

Bob came out of the army as a major and, upon return to his company, was elected assistant to the executive vice-president. This past December he was elected vice-president in charge of all operations of the New York Coal Sales Co., its divisions and its subsidiaries, the New York Coal Co. and the Hocking Valley Brick Co.

New York Coal Sales Co. is a 100 percent Ohio organization now celebrating its 50th anniversary and has diversified operations in the rock products industries. Among them are the Superior Cement Division, with a portland cement plant at Superior, Ohio; the Plum Run Stone Division with a crushed limestone and agstone plant at Peebles, Ohio; the Highland Stone Division with a crushed stone and agstone plant at Danville, Ohio; and the Basic Construction Materials Division with a sand and gravel plant at Chillicothe, Ohio. Ready-mixed concrete is produced at Chillicothe, Circleville and Hillsboro and a large-capacity concrete products plant is operated at Chillicothe, all under the Basic Construction Materials Division. In addition, the company is active in road-building.

In spite of the responsibility for these diversified operations and those of the subsidiary companies, Bob has more than average interest in sports and dancing but his main hobbies are his family and his home. He has a son, Johnnie. His wife, Mary Lou, attended the convention with Bob and no doubt was as surprised as he was when he was elected president.

Penn-Dixie Appointments

M. L. SILCOX has been appointed assistant operating manager of Penn-

John H. Jones

M. L. Silcox

Dixie Cement Corp., Nazareth, Penn., with headquarters in Chattanooga, Tenn. He was formerly superintendent of the Clinchfield, Ga., plant and will be succeeded in this position by John H. Jones, who has been plant engineer at Clinchfield. Mr. Silcox started his career in the cement industry in 1921, in the laboratory department of the Clinchfield Cement Corp., Kingsport, Tenn. In 1929 he became chief chemist at the Des Moines plant at the time it was acquired by Penn-Dixie. He served in that capacity until 1945, when he was appointed superintendent at Clinchfield.

Mr. Jones joined Penn-Dixie in 1948 as a student engineer at Nazareth during the summer months. Following graduation from Lehigh University with an M. E. degree, he was appointed engineer-draftsman, and subsequently became plant engineer at Bath, Penn., and later at Clinchfield, Ga.

Appointed Vice-President

MILTON FALKOFF, assistant to Col. Henry Crown, chairman of the board of the Material Service Corp., Chicago, Ill., has been promoted to vice-president and comptroller. Born in Chicago, Ill., Mr. Falkoff is an alumnus of Northwestern University, George Washington University and New York University.

Sanderson Succeeds Baker

LEWIS R. SANDERSON, executive vice-president of National Gypsum Co., Buffalo, N. Y., has been elected president of the company. He succeeds Melvin H. Baker, who has been named chairman of the board. Born in Des

Lewis R. Sanderson

Moines, Iowa, Mr. Sanderson graduated from Iowa State College in 1914. He started his career in the gypsum industry in a laboratory doing quality control. Subsequently he became foreman of a mixing department, mill foreman, superintendent of a mixing mill, and plant manager. He was plant manager of the New York, N. Y., plant of Atlantic Gypsum Co. in 1936 at the time it was purchased by National Gypsum Co. During World War II, Mr. Sanderson was appointed general manager of the Bluebonnet Ordnance Plant, MacGregor, Texas, which National Gypsum Co. operated for the U. S. government as a bomb loading plant. In 1945, he returned to Buffalo, N. Y., as director of construction and reconversion and was placed in charge of the company's expansion and modernization program. Later he became vice-president and a director of the company. He has been executive vice-president since 1950.

Sales Executives

CLARENCE P. SHAW, formerly sales manager of the Superior Cement Division, New York Coal Sales Co., Columbus, Ohio, has been appointed assistant executive vice-president of sales and public relations, with headquarters in Chillicothe, Ohio. William B. Carder has been named to succeed Mr. Shaw as sales manager in Portsmouth, Ohio. Robert F. Gaines has been appointed vice-president of the Hocking Valley Brick Co., a subsidiary, and E. M. Harper remains as sales manager. W. A. Rodgers has been made sales manager of the Basic Construction Materials Division for both Chillicothe and Circleville. V. K. Gamble has been appointed general manager of the Southern Quarries and Contracting Division, and Leo L. Davis has been made manager of the Plum Run and Highland Stone Divisions. Robert M. Patton has been named vice-president in charge of operations.

Officers of New York Coal Sales Co. include Edwin H. Davis, president; G. K. Mitchell, executive vice-president; H. H. Moore, vice-president in charge of cement operations, and George W. Quillin, secretary-treasurer.

On Advisory Committee

HOWARD P. EELS, JR., president of Basic Refractories, Inc., Cleveland, Ohio, has been appointed a member of the advisory committee of the Mackay School of Mines.

First Citizen of 1951

FRANK E. MCCASLIN, president, Oregon Portland Cement Co., Portland, Ore., was recently chosen by the Portland Realty Board as Portland's First Citizen of 1951. He was presented a plaque by Albert R. Bullier, president of the board, at a banquet attended by nearly 600 civic and business friends. Prominent speakers at the dinner included Chief Justice James T. Brand of the Oregon Supreme Court, Governor Douglas McKay, and Mayor Dorothy McCullough Lee. In response to receiving honors as Portland's First Citizen of 1951, Mr. McCaslin said: "Business executives must devote a substantial part of their time to public endeavors in their community and country. If we don't do it, there are some who stand willing to do it for us—at a price, and that price is too great."

Frank E. McCaslin

Executive Vice-President

HARRY A. CLARK has been elected executive vice-president of Consumers Co., Chicago, Ill. He joined the company in 1922 and has been vice-president in charge of sales for the past two years. Until the recent merger of the Agricultural Limestone Institute and the National Agricultural Limestone Association into the National Agricultural Limestone Institute, he was a representative of A.L.I. on the

Harry A. Clark

board of directors of the National Crushed Stone Association. At present he is a member of the board of the newly formed N.A.L.I.

Assistant Vice-President

JOHN W. MEADER, economist for Great Lakes Carbon Corp., New York, N. Y., has been elected assistant vice-president of the corporation. Author of many articles on engineering and economic subjects, Mr. Meader served from 1941 to 1945 as consultant in the U. S. Bureau of Aeronautics in aircraft production, weapons development and operations analysis. He is a graduate of Massachusetts Institute of Technology.

Senior Physicist

EUGENE L. PERRINE has been appointed senior physicist at the Evanston, Ill., research laboratory of the Zonolite Co., Chicago, Ill. For the past five years, Mr. Perrine has been a member of the physics research department at Armour Research Foundation, Chicago.

Division Sales Manager

LEE C. HAMILTON has been appointed division sales manager of Huron Portland Cement Co., Detroit, Mich. He was formerly traffic manager and will be succeeded in this position by Ernest J. Lubeck.

C. of C. Director

MAX H. MILLER, president of United Cement Products Co., Wichita, Kan., has been elected a director of the Wichita Chamber of Commerce.

Conference Chairman

THOMAS L. AMIS, president of Wamix, Inc., Dallas, Texas, has been named national chairman of the Young American Business Conference for 1952. This is an organization concerned with studies and recommendations pertaining to the 1950 excess profits tax law. Mr. Amis served as vice-chairman of the conference last year.

Committee Chairman

J. P. EYRE PRICE, president of Wyoming Sand and Stone Co., Scranton, Penn., has been appointed chairman of the Scranton Scrap Mobilization Committee.

OBITUARIES

HARRY LANDA, owner of the Landa rock crushing plant at New Braunfels, Texas, died recently after a long illness. He was 89 years old.

MARSHALL T. LANDRUM, of Dayton, Ohio, former chemist at the Fairborn, Ohio, plant of Universal Atlas Cement Co., New York., N. Y., died recently after a year's illness. He was 45 years of age. A native of Terre Haute, Ind., Mr. Landrum had been a chemist at the Fairborn plant for 26 years. He left there to accept a position as chemist at Forge Cement Co., Northtown, Penn., returning recently to Dayton, Ohio.

ALLAN M. HIRSH, founder and chairman of the board of Lock Joint Pipe Co., East Orange, N. J., died December 21. He was 73 years of age. Born in Richmond, Va., Mr. Hirsh was graduated from Philips Academy in 1897 and Yale University in 1901. He founded the Lock Joint Pipe Co. in 1905 and was president until 1950 when he became chairman of the board. Mr. Hirsh pioneered many of the great major developments of the industry, among them being the split concrete castings to protect wooden piles from termites, which eventually led to concrete pipe for sewers and storm drains. In 1914 he entered the concrete pressure pipe field and, from 1919 to 1921, built many of the first modern concrete pressure pipe lines.

WHARTON CLAY, executive secretary of the Perlite Institute, New York, N. Y., died January 2. He was 72 years old. Born in Chicago, Mr. Clay was an architectural engineering graduate from the University of Illinois. In the early 1930's, he served

Wharton Clay

as an adviser in the establishment of the Federal Housing Administration. During World War II, he was a government adviser again, cooperating with federal agencies in the fuel conservation program. Mr. Clay was formerly secretary-treasurer of the National Mineral Wool Association and commissioner of the Metal Lath Manufacturers Association. He was a member of the American Standards Association, American Society of Heating and Ventilating Engineers, Building Officials' Conference of America, Architectural League of New York, National Fire Protection Association, American Trade Association Executives and the Pacific Coast Building Officials' Conference.

C. C. LONG, secretary of Lehigh Portland Cement Co., Allentown, Penn., died recently after a short illness. He was 61 years old. Mr. Long joined the company in 1915 when the former Virginia Portland Cement Co., where he was chief clerk, was purchased by Lehigh and he was named chief accountant for a subsidiary company. In 1925 Mr. Long was appointed auditor and in 1931 he was elected secretary of the firm.

WILLIAM P. MCDONALD, president and a director of Florida Crushed Stone Co., Ocala, Fla., died recently at his Mountain Lake home after a brief illness. He was 71 years old. Mr. McDonald was also president of the William P. McDonald Corp., which has a rock quarry and brick and asphalt plant at Brooksville, Fla.

WILLIAM T. KUEHN, president of Elliston Lime Co., Helena, Mont., died recently after a brief illness. He was 85 years old. Born in the Little Waumedee Valley near Alma, Wis., he was reared in Wabasha, Minn., and moved to Boulder, Mont., in 1889, where he engaged in the furniture business. He sold his business in 1894 to move to Elliston, where, with his brother, Henry, he entered the grocery and general mercantile business. He acquired Elliston Lime Co. in 1902 and expanded the plant from just a lime burning kiln to a hydrating plant widely known in the industry.

E. KEMPER CARTER, chairman of the board of The Carter-Waters Corp., Kansas City, Mo., died December 23. He was 67 years of age. Born in St. Joseph, Mo., Mr. Carter attended William Jewell College and was graduated from the University of Missouri with a degree in civil engineering. He was successively deputy county engineer of Buchanan county, assistant city engineer of St. Joseph, city engineer and superintendent of water works at Liberty, Mo., and sales engineer for the Standard Asphalt and Rubber Co. before entering the Army in World War I. He was commissioned a captain in the Corps of Engineers and served in France for a year before his discharge in 1919. After the war, Mr. Carter was engineer-special representative for the Sinclair Refining Co., Chicago, and in 1921 he founded his own company, the E. K. Carter Co. One year later, with Albert R. Waters, whom he had known during his school days at the University of Missouri, he founded The Carter-Waters Co. which celebrated its 30th anniversary on January 1, 1952. He was president of the corporation from 1922 until 1940.

Mr. Carter was a member of the American Society for Testing Materials, American Road Builders Association, American Society of Civil Engineers, Missouri Society of Professional Engineers, Missouri Highway Engineers Association and the Association of Asphalt Paving Technologists.

JOHN EDWARD MONK, president of Builders Sand Co., Wichita, Kan., died recently at the age of 72. He was the first secretary-treasurer of the Missouri-Kansas Aggregate and Concrete Producers Association which was organized late in 1949.

CLARENCE J. SWAIN, superintendent of the Buffalo, N. Y., plant of Buffalo Slag Co., Inc., Buffalo, N. Y., died December 28. He was 71 years old. A native of Huntington, Ind., Mr. Swain joined the company in 1913. Two years later he was appointed superintendent of Plant No. 1. Since that time, he has served as superintendent of each of the company's plants.

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The mixing plant, requiring only two men to operate, consists merely of conventional weigh box and mixing unit, plus pulverization pug mill and necessary equipment to inject liquid flux oil into mill. The rotary dryer, steam boiler, dust collecting system, screens, etc. of the conventional hot mix plants are entirely eliminated. Only special ingredients required are petroleum fractions, easily obtainable nearly everywhere.

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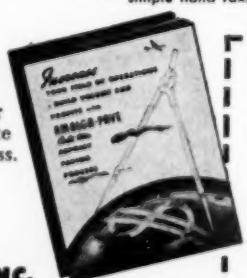

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industry news

Safety awards are presented to employes of Old Colony Crushed Stone Co., by Fairfield & Ellis Insurance Agency. Front row, left to right, Ernest Wilson of the insurance agency; Victor Orinofsky, safety chairman; Melville Stewart, general manager; and Walter Burke, also from the agency. Back row, left to right: Frank Mitchell, office manager; Joseph Cahill, sales manager; and Francis Melaugh, construction engineer

Safety Celebration

OLD COLONY CRUSHED STONE CO., Quincy, Mass., recently held a safety-meeting banquet for its employes, in celebration of the completion of 260 days, or 125,800 man-hours without a lost-time accident. Approximately 60 people were present. Walter P. Burke, supervising safety engineer for Fairfield & Ellis Insurance Agency, who served as chairman of the meeting, spoke briefly regarding the importance of cooperation between management and employes, and also extended the congratulations of the insurance company on the fine safety record completed by the employes.

Melville Stewart, general manager of Old Colony Crushed Stone Co., also spoke to the employes, thanking them for their cooperation and interest shown throughout the year and urged them to continue their fine work in 1952. Each employe was presented with a pig-skin wallet, suitably inscribed "Old Colony Crushed Stone Co.—No lost-time accidents—1951."

Freight Rates

NATIONAL INDUSTRIAL SAND Association recently announced that Examiner McGrath has released his proposed report to the Interstate Commerce Commission in which he recommends relief for the industrial sand industry in accordance with the industry's complaint in Docket No. 30624.

If the commission adopts the proposed report, this will mean that existing rates on sand in closed cars will be found to be unreasonable "insofar as they include greater increases in the aggregate in the basic rates in effect on June 30, 1946, than do the rates on industrial sand, in open cars, for corresponding distances." It was estimated that this would mean, for practical purposes, a reduction of 50 cents per ton in the closed car rates.

Warner Modernizes Quarry

WARNER CO., Philadelphia, Penn., recently installed additional equipment at its Cedar Hollow plant. New equipment includes a 2½-cu. yd. Marion diesel shovel for the quarry and an Autocar tractor, used to haul stone from the quarry to the primary crusher. The new tractor is one of three new units of this type. The company stated that the increasing distance which has to be traveled from the quarry face to the dump hopper at the crusher, has necessitated newer and faster trucks.

Chemical Exposition

THE 23RD EXPOSITION of Chemical Industries, held November 16-December 1, 1951, Grand Central Palace, New York, N. Y., was reported to be the largest in the 36-year history of this biennial institution. A record number of 457 exhibits crowded every square foot of available exhibit space and revealed many substances and a great deal of mechanical equipment never before publicly shown. Approximately 47,000 visitors registered during the week under the invitation plan which excluded the general public and confined attendance to persons having a scientific or business interest in the exhibits.

Dravo Honors Employes

DRAVO CORP., Pittsburgh, Penn., recently distributed gold lapel pins to 262 employes who have recently completed service periods of 10 and 15 years. Pins were also awarded to 35 employes of subsidiaries. In all there are 812 employes with between 10 and 20 years of service at Dravo. In addition, there is a total of 465 employes who belong to Dravo's "Veterans' Association," which is comprised of employes having 20 or more years of service with the corporation and its subsidiaries.

Management Excellence Awards

NATIONAL GYPSUM CO., Buffalo, N. Y., United States Gypsum Co., Chicago, Ill., and The Arundel Corp., Baltimore, Md., have been awarded Certificates of Management Excellence, for the year 1951, by the American Institution of Management, a nonprofit foundation, devoted to the study and improvement of corporate management and techniques. Only 298 firms in the United States and Canada were deemed eligible to receive the designation.

Selection of the winners was based on an appraisal of over 3000 concerns and included such factors as production efficiency, sales figures, executive evaluation, corporate structure, health of earnings growth, research and development, fairness to stockholders, etc. U. S. Gypsum Co. and The Arundel Corp. also received Management Excellence Awards in 1950.

Cover Picture

THE KETTLE OR CALCINING operation of United States Gypsum Co.'s vast Plaster City mill in California's Imperial Valley is pictured on this month's cover. The calcining phase of processing is one of the major steps in the manufacture of gypsum products. Here the stone is "cooked" and its natural water of crystallization driven off. The resulting calcined gypsum is often known as plaster of paris, which has a thousand uses. The history of United States Gypsum Co., celebrating its 50th anniversary this month, can be found on page 94.

Bonus Plan

HALLIBURTON PORTLAND CEMENT Co., Corpus Christi, Texas, recently issued bonus checks totaling $55,000 to employes. The company's bonus plan provides that, after certain deductions, 12.5 percent of remaining profits, before deduction of income taxes, will be placed in a fund to be distributed to all eligible employes at the end of each year. Each participant in the company's profit-sharing plan received approximately 8 percent of his year's earnings. This payment represents about 75 percent of the 1951 profit-sharing bonus, the remainder to be distributed by March 31.

Huron Expansion

HURON PORTLAND CEMENT Co. recently announced plans to increase the capacity of its Alpena, Mich., plant, said to be the world's largest, by more than 25 percent, and to purchase a new freighter to carry the additional output.

Starting in 1952, construction will begin on four additional rotary kilns, which together with new grinding facilities, boilers, etc., will increase production by 2,000,000 bbl. per year. The company has already boosted production capacity by 90 percent since the end of World War II.

The Huron Transportation Co., subsidiary of Huron Portland Cement Co., has contracted for the purchase of the M. S. Coastal Delegate, a C1MAV1 ocean cargo vessel, built in 1945 at Wilmington, Calif., for the U. S. Maritime Commission. This diesel-driven ship will be converted and brought up the Mississippi river and Illinois waterway into the Great Lakes for addition to the Huron fleet. It is to be converted into a self-unloading bulk cement carrier, featuring an air-activated conveying system, using the Huron-developed F-H Airslide, such as was installed aboard the company's steamer Samuel Mitchell as a post-war conversion in 1948.

Gypsum Production

DOMESTIC MINE production of crude gypsum was 2,270,710 short tons during the third quarter of 1951, as reported to the Bureau of Mines. Production of calcined gypsum during this quarter declined slightly from that of the same period in 1950. The output of all gypsum board in the third quarter of 1951 showed a slight increase over the corresponding quarter of 1950, but was 4 percent lower than in the preceding record-breaking quarter. The quantity of gypsum used as retarder in cement soared to a record high of 593,454 short tons.

As a group, greatest gains were registered by the uncalcined products; agricultural gypsum showed a quarterly increase of 39 percent and a 77 percent increase for the first nine months of 1951, as compared to the same periods in 1950.

Production for the third quarter of 1951 was listed as follows:

Crude mined	2,270,710 short tons
Calcined produced	1,977,444 short tons
Cement retarder	593,454 short tons
Base-coat plaster	592,558 short tons
Total board	1,559,555 thousand sq. ft.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 20,736,000 bbl. of finished cement in November, 1951, as reported to the Bureau of Mines. This was an increase of 3 percent compared with the output in November, 1950. Mill shipments totaled 18,001,000 bbl., an increase of 9 percent over the November, 1950, figure, while stocks were 52 percent above the total for the same month in 1950. Clinker production during November, 1951, amounted to 21,164,000 bbl., an increase of 4 percent compared with the corresponding month of the previous year. The output of finished cement during November, 1951, came from 153 plants located in 36 states and Puerto Rico. During the same month of 1950, 20,226,000 bbl. were produced in 150 plants.

Wyoming Alumina Plant To Be Completed

THE BUREAU OF MINES will take over and complete construction of the government-owned experimental alumina plant at Laramie, Wyo., for recovering alumina and cement raw material from anorthosite rock and other low-grade aluminous ores, according to a recent report in *Chemical and Engineering News*.

The Laramie plant, one of four experimental plants constructed by the Defense Plant Corp. during World War II, was never completed and, in 1946, the Reconstruction Finance Corp. cancelled the contract for completion and operation of this plant. However, in early 1951, serious consideration was again given to developing domestic sources, since bauxite imports were again threatened by world events. An appropriation of $250,000 was made available for completion of the Laramie plant and an additional $1,000,000 has been requested for 1953 plant operation.

Coming Conventions

February 11-15, 1952—
National Sand and Gravel Association, 36th Annual Convention and Exhibit, Conrad Hilton Hotel, Chicago, Ill.

National Ready Mixed Concrete Association, 22nd Annual Convention and Exhibit, Conrad Hilton Hotel, Chicago, Ill.

February 18-20, 1952—
National Crushed Stone Association, 35th Annual Convention and Exhibit, Conrad Hilton Hotel, Chicago, Ill.

February 18-20, 1952—
National Concrete Masonry Association, Annual Convention, New Yorker Hotel, New York, N. Y.

February 18-21, 1952—
American Institute of Mining and Metallurgical Engineers, 79th Annual Meeting, Hotel Statler, New York, N. Y.

February 26-28, 1952—
American Concrete Institute, 48th Annual Convention, Netherland Plaza, Cincinnati, Ohio

February 27-28, 1952—
American Concrete Pressure Pipe Association, 3rd Annual Convention, Drake Hotel, Chicago, Ill.

February 28-29, 1952—
Autoclave Building Products Association, 46th Annual Convention, Roosevelt Hotel, New Orleans, La.

February 28-March 1, 1952
American Concrete Pipe Association, 44th Annual Convention, Drake Hotel, Chicago, Ill.

March 3-5, 1952—
American Concrete Agricultural Pipe Association, 2nd Annual Convention, Brown Palace Hotel, Denver, Colo.

March 5-6, 1952—
Iowa Agricultural Limestone Association, Inc., 7th Annual Convention, Savery Hotel, Des Moines, Iowa.

May 14-16, 1952—
National Industrial Sand Association, 17th Annual Meeting, The Homestead, Hot Springs, Va.

June 23-27, 1952—
American Society for Testing Materials, 50th Anniversary Meeting, Hotels Statler and New Yorker, New York, N. Y.

Brazilian Lime Plant

INDUSTRIAS REUNIDAS F. MATARAZZO, Sao Paulo, Brazil, is building a two-kiln lime plant near Sao Paulo. The kilns are of the vertical type, designed by Azbe Corp., and will use as fuel, gas generated from wood in integral gas producers. A new lime hydrating plant is also being designed by Azbe Corp. for erection at the plant.

Raw material is a dolomitic limestone which is said to lend itself to almost complete hydration of all oxides by comparatively short time retention under certain conditions of temperature and humidity.

Gypsum Lease Suit

CERTAIN-TEED PRODUCTS CORP., Ardmore, Penn., which has been mining gypsum on property leased in Ft. Dodge, Iowa, is defendant in a suit in which the property owners ask that possession of the premises be returned to them and the gypsum company be required to discontinue operations at the site. Owners of the land claim the corporation has not lived up to its agreement to take continuously each month at least 60 percent of the gypsum required for its operation from the land in question. The property owners claim that no rock was taken from the property during a total of four months in 1947 and 13 months during 1949, 1950 and 1951, and that the percentage requirement was not met during 25 additional months. The plaintiffs ask the court to declare that the alleged breach entitles them to terminate the 10-year lease signed in 1945, and that the company be compelled to pay the plaintiffs royalties amounting to $0.10 per ton for 60 percent of rock consumed each month when no rock or insufficient rock was removed from their property.

The Certain-Teed company, in answer to the suit, states that it has taken more than 75 percent of total rock quarried since March 1, 1946, from the land in question and claims it was not required by lease to take the specified percentage of rock from the land each month, but rather over a prolonged period. The company stated it had quarried a total of 717,025 tons from the property since beginning operations there.

Dragon-Lawrence Merger

AN ARTICLE PUBLISHED recently in *The Dragon* gives details and reasons for the merger of Dragon Cement Co., Inc., and Lawrence Portland Cement Co., and the elimination of the name of the Lawrence company.

The merger, which became effective November 30, effected no change in plant or office personnel. Dragon has acquired all of Lawrence's assets and properties. The merger was authorized by the owners of a majority of the outstanding stock of Lawrence. Holders of Lawrence's shares may exchange their stock, share for share, for Dragon.

Lawrence started making Dragon cements in 1889 and the two names have created a certain amount of confusion as to whether they were one and the same, or two separate corporations. One of the principal reasons given for eliminating "Lawrence" and adopting "Dragon" was to do away with this confusion. It is believed that it will be to the company's advantage to have the company name and the brand name of its product one and the same.

The consolidation of Lawrence and Dragon, and the incorporation of the new company in Maine are consistent with the greater emphasis being placed on operations in New England, and Dragon owns the only cement mill in New England. The capacity of the mill at Thomaston, Maine, is in process of being expanded by 50 percent.

An additional reason given for the merger was that a corporate home in Maine means savings on both state and local taxes. The principal office of Dragon Cement Co. is at Thomaston. A new sales office has been established in Camden, N. J., replacing the Philadelphia, Penn., office.

Safety Celebration

NATIONAL PORTLAND CEMENT CO., recently held a dinner for the employes of its Brodhead, Penn., plant, in observance of having operated 1000

Among those attending the National Portland Cement Co. safety dinner were, left to right: Ivan Krabbe, plant manager; Ralph Beitler, purchasing agent and safety director; and Arthur Meckes, president of plant union

days without a lost-time accident. The achievement meant a total of 1,123,897 man-hours of safe operation for the entire plant and office, and 224,199 for the quarry and crushing department. Safety awards were presented to all employes.

Celebrates 40th Anniversary

CORVALLIS SAND AND GRAVEL CO., Corvallis, Ore., celebrated its 40th birthday in December. It was founded by J. H. Gallagher in 1911 when he secured a contract to supply 300,000 cu. yd. of gravel for construction of a new railroad between Corvallis and Monroe. Shortly after completion of that job, the company received a contract to supply concrete block for a large building in Corvallis. The organization has continued to grow and at present owns property for a mile along the Willamette river. Ready-mixed concrete is also furnished by the company; four trucks are operated. A new concrete block and drain tile plant was built in 1947.

Opens Chicago Office

E. LEE HEIDENREICH, JR., consulting and designing engineer, Newburgh, N. Y., has announced the opening of a Chicago, Ill., office, as successor to Brunner & Laws, industrial engineers, Chicago. Specialized engineering services include crushing plants and milling plants. A. C. Brunner is in charge of the Chicago office which is at 9 South Clinton St.

Phosphate Production

FLORIDA PHOSPHATE production in 1950 amounted to 8,085,870 long tons, an increase of 184 percent over the year 1940, as was recently announced by the Florida Chamber of Commerce. The 1950 sales at the mines totaled $45,277,842.

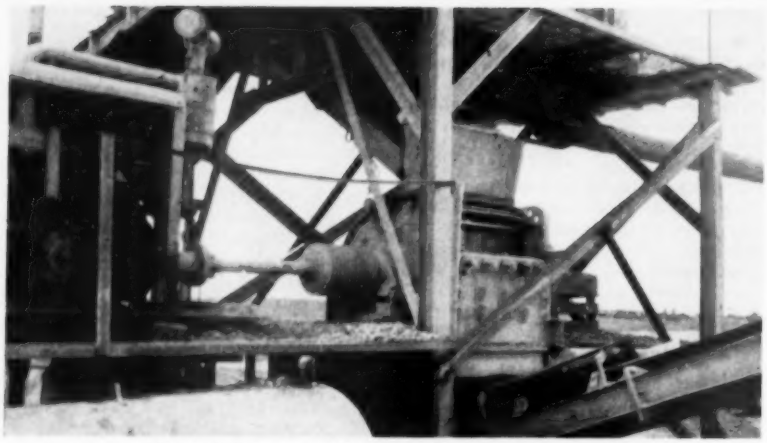
From 1940 through 1947, Florida produced 65 to 73 percent of the national volume of phosphate sold, and this increased to 79 percent in 1950. National production showed an increase of 156 percent over the 1940 level. Other phosphate producing states include Tennessee, Idaho, Montana, Utah and Wyoming.

Road Test Program

THE HIGHWAY RESEARCH BOARD of the National Research Council in Washington, D. C., recently announced that negotiations have been completed with ten state highway departments of the Western Association of State Highway Officials for conducting a full-scale test of bituminous pavement in southeastern Idaho. Cooperating in the test are the highway departments of California, Colorado, Idaho, Nevada, New Mexico, Oregon, Texas, Utah, Washington and Wyoming, the Bureau of Public Roads and the petroleum industry. Truck manufacturers of the Automobile Manufacturers Association have promised to furnish the test trucks, providing they do not become committed to a greatly increased defense production effort.

The test road will consist of two enclosed loops, each with two 1900-ft. straightaways of test pavements, identical in design. Controlled test traffic consisting of two different prevailing weights of single-axle trucks will be used on one loop, and two different prevailing weights of tandem-axle trucks will be used on the other. Pavement on the test sections will vary in thickness from 6 to 22 in., and the relative effects of the different types of test trucks on all sections will be determined and the results utilized in future design. Records of the cost of maintaining the various sections will also be kept as an aid in determining the actual cost of each highway type.

HINTS and HELPS



Flats and slivers are put through a diesel-driven hammermill

Eliminating Flat Particles

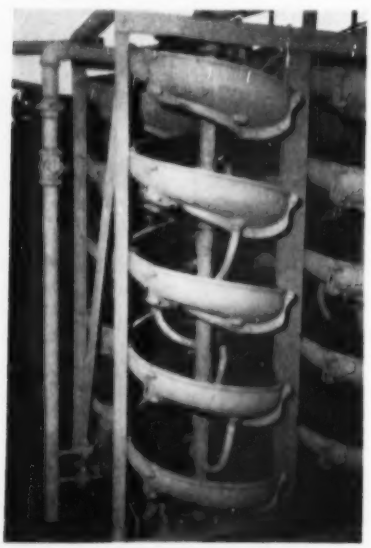
AT A QUARTZITE OPERATION in South Dakota, the problem of flats and slivers was solved by the installation of hammermills which operate without grids. The material is first sized and any size having an excessive amount of objectionable flats is sent to its hammermill. The hammers simply give the rock a slap to break it into two or more pieces and the crushers are not for purposes of reduction. The plan works sufficiently well to meet army specifications but hammer wear is high.

An additional novelty of the setup is the direct connecting of one of the hammermills to a diesel engine as shown in the illustration. The more conventional practice is to drive the hammermill by V-belts.

Applications for Protective Coatings

IN A FLORIDA OPERATION, Humphreys spiral concentrators are used to make a gravimetric separation of a beach sand. In these spirals a separation of the heavier material is accomplished by centrifugal action imparted to a dilute pulp as it flows down the spiral.

To make a satisfactory separation the inside of the spiral must be very smooth. Naturally there is some wear of this inner surface due to the action of the sand. When wear reaches a certain point, the spirals are unbolted and taken to the repair shop where they are first sand blasted, then given a coat of neoprene paint which gives the spiral a smooth, water-resistant coating. This same material might be used in many rock products operations and give added life to worn equipment.



Protective coating gives longer life to spirals

Stockpiling arrangement with two belt conveyors situated over the stockpile

Stockpiling Setup

AT A CRUSHED GRAVEL OPERATION in the Missouri River Basin, all minus 2-in. material must be wasted because of specification requirements. Since rejects from over a million tons of pit-run gravel are involved, stockpiling runs into large volumes. Three belt conveyors are used in the stockpiling operations. The one in the foreground (see illustration) is inclined and feeds the other two which are situated over the top of the large waste pile. No cribbing or supports are used, or needed; the conveyor segments simply rest on the muck itself. The two off-bearing belts operate in series. Note the wind guards on the first belt.

Depth Gauge for Dredging

AT A DREDGING OPERATION in the Southeast, a 20-in. hydraulic dredge equipped with a cutter is used for excavation. A prospecting crew works ahead of the dredge and establishes definite horizons for digging, to prevent the dredge from digging too deep in the deposit. The dredge operator is kept advised as to his lower digging limits.

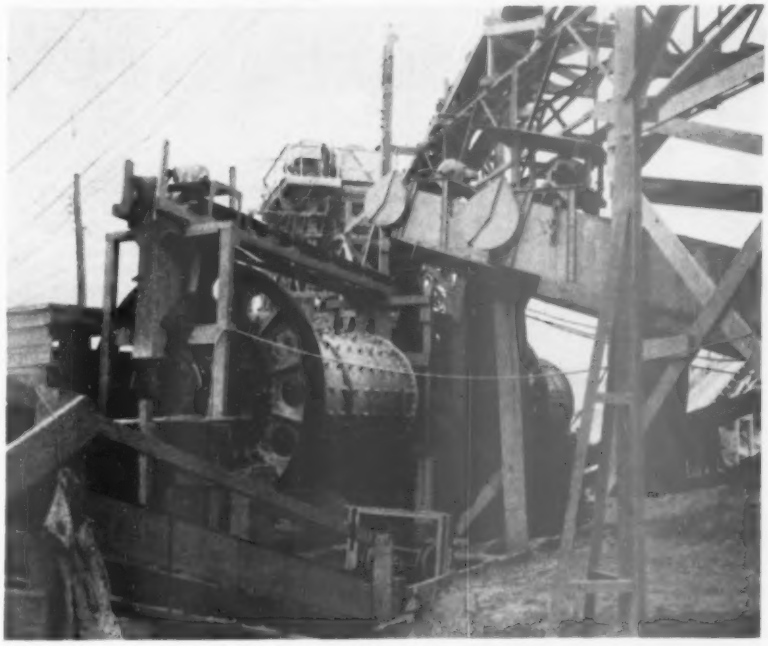
To aid the dredge operator in gauging the depth of the cutter, a gauge has been mounted on the boom. On this gauge is a rope and weight arrangement that indicates to the operator the exact depth at which he is currently digging.

The white marker (see illustration) at the lower end of the gauge is resting near zero elevation, as at the time the picture was taken the cutter was just out of the water.

Gauge indicates depth of digging operations

Rod Mill Conversion

AN OPERATOR in the Middle West had a 6- x 12-ft. standard trunnion feed rod mill in which the material was fed through one trunnion and discharged through the other. It was altered to a peripheral discharge, feeding into both ends and discharging the pulp through ports cut in the center line of the horizontal drum, the center line being a plane parallel to the end castings of the mill. To get feed material to one end was no problem—it simply fell by gravity to the drum-type feeder; but to get feed to the other end of the mill, a small, flat-running belt conveyor was built over the rod mill (as shown in the illustration) and the coarse fragments from the dewaterers split to both ends of the rod mill. The purpose of the mill was to supply additional minus 100, 200 and "pan" material to meet requirements of the specification.



Rod mill converted to peripheral discharge

Thawing Pits

FREEZING UP of bulk materials in hopper-bottom cars constitutes a major problem to producers in a great many industries. An indirect radiant heating method, developed by Hauck

Thawing pit, featuring indirect, radiant-heating method, reduces time and cost of thawing bulk materials in hopper-bottom cars

Manufacturing Co., Brooklyn, N. Y., has reduced considerably the cost of time and labor for many producers who have adopted this type of thawing pit. The accompanying illustration shows this thawing pit in action. The heat is produced by either oil or gas burners, firing from both sides of the refractory-lined pit. This indirect radiant heating method avoids damage to car hoppers, air brake cylinder packing, etc., because there is no direct flame blast or impingement on structural parts.

The following thawing time per car in various industries has been reported:

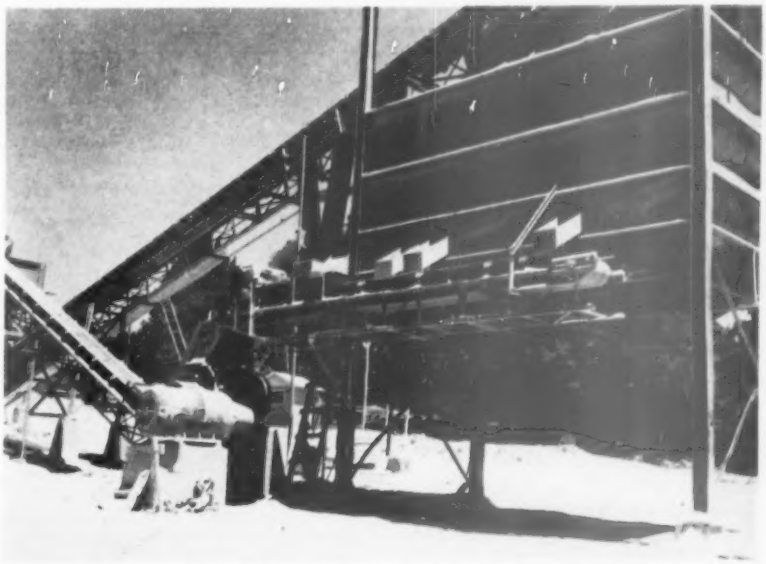
Limestone cars (1-in. rock)	20-30 min.
Other limestone cars	45-60 min.
Coal cars—average	15-20 min.
—badly frozen	30-40 min.
—buckwheat coal	2 hr.
Iron-ore cars—average	45-60 min.
—badly frozen	90 min.

At a large railroad coaling station where it previously took gangs of labor, working day and night, with picks, shovels, blow torches and hot water, it is now possible to operate 12 thawing pits with only one man. For best results, one thawing pit for each hopper on a railroad car is recommended.

A large stone producer, who has installed thawing pits at his plant in Ohio, reports that during previous winters, it was necessary to use four to five men per shift to keep sufficient coal unloaded during freezing weather, but with the use of the thawing pits, only two men per shift are now needed.

Hammermill Installation

A NEAT AND SERVICEABLE INSTALLATION of a hammermill for reduction of commercial limestone rejects to agstone was recently observed at a new plant in Kentucky. A flat-running belt conveyor passes in front of gates built into the sides of the bins and these regulate the feed to the hammermill. Rejects, or fines, from the vibrating screen on top of the main bin can be chuted directly to the mill. The throughs from the hammermill are conveyed over a belt back to a truck bin, or can be put through the reduction mill in closed circuit, in which event, the fines are put in a bin in the main structure at right as shown in the illustration.



Belt conveyor and gates in bins which regulate feed to the hammermill

NEW Machinery

Gasoline engine driven arc welder

Gasoline-Driven Welder

HOBART BROTHERS Co., Hobart Square, Troy, Ohio, has announced a gasoline engine driven arc welder with control panel mounted on the end of the unit at the generator end. The generator is of symmetrical four-pole multi-range design; there are four laminated main poles and four interpoles which are removable. The volt-amp. adjuster is said to provide 100 steps of fine adjustment in each of the ten main ranges. The entire unit is enclosed in a weatherproof steel canopy, and is available either as a stationary welder or mounted on a pneumatic-tired four-wheel trailer.

Arc Welders

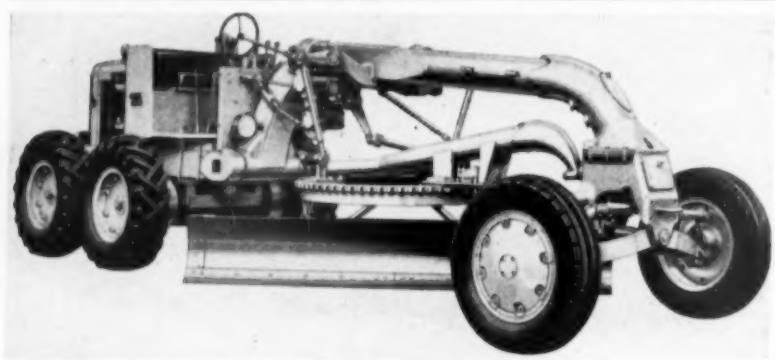
AIR REDUCTION SALES Co., Div. of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y., has announced its Model GA Wasp direct current arc welders, available in 150- and 200-amp. sizes. Continuous overlap from each current range to the next is said to provide a wide, unbroken range of welding current—20 to 185 on the 150-amp. machine and 30 to 250 on the 200-amp. welder. These lightweight models are portable when mounted on two-wheel carriages.

Small Diesel Truck

GMC TRUCK & COACH DIV., General Motors Corp., 660 South Blvd., East, Pontiac 11, Mich., has in production its 3-cyl. diesel truck, said to be the smallest and lightest diesel to be commercialized for use on American highways. This truck, GMC D450-37, is a 2½-ton unit with five available wheelbases for either truck or highway tractor models. The 110-hp. model is designed for truckers operating in the

Diesel truck of 2½-ton weight

19,500-lb. G.V.W. to 35,000-lb. G.C.W. class. Maximum geared speed is 54.4 m.p.h., with 9:00/20-10 ply tires, and there is a total gear reduction of 46.9.



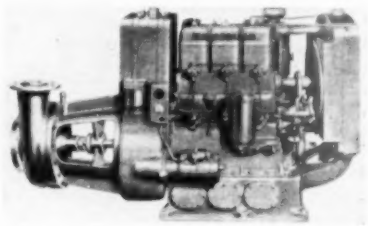
Diesel-powered motor grader

Motor Graders

ALLIS-CHALMERS MANUFACTURING Co., Tractor Div., Milwaukee, Wis., has announced two newly designed motor graders, Models AD-40 and AD-30. The 4-cyl., 2-cycle, diesel-powered AD-40 weighs 23,000 lb. and develops 104 brake hp. The AD-30 is powered by a 3-cyl., 2-cycle diesel engine, weighs 22,700 lb. and develops 78 brake hp.

Extends Diesel Line

NORDBERG MANUFACTURING Co., Milwaukee 7, Wis., has announced the addition of a 4-cycle, 3-cyl. diesel en-



Diesel engine with centrifugal pump attachment

gine, known as the 4FS3, to its line of diesels. This engine is rated 30 to 45 hp. at 1200 to 1800 r.p.m. and supplements the company's 4FS 1- and 2-cyl., 10- to 30-hp. diesel engines. The unit has a 4½-in. bore and 5¼-in. stroke and is a 4-cycle, vertical, mechanical injection diesel, available in d-c or a-c models from 20-30 kw. in all standard voltages, 50 or 60 cycles.

Limit Switch

GENERAL ELECTRIC Co., Schenectady 5, N. Y., has announced a rotating-type limit switch for application where reversing operation is to be coordinated with the number of revolutions of a motor shaft or driven equipment. The unit consists of two size No. 2 Switchettes, each having one normally open and one normally closed circuit. Switch units are operated independently by cams rotated through a worm and gear reduction from a shaft extending outside the case.

Crushers and Screens

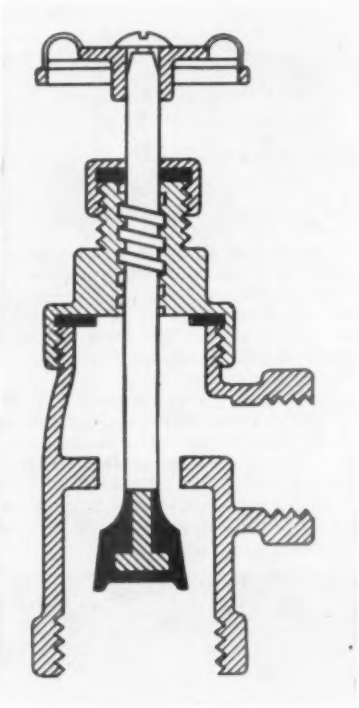
BONDED SCALE AND MACHINE Co., 2176 S. Third St., Columbus 7, Ohio, during the past year has developed crushers and vibrating screens for lightweight aggregate processing. These machines are designed to handle pumice, perlite, vermiculite, expanded clay materials and a variety of cinders. Several new crusher sizes have been developed, with a variety of roller surfaces. The company's vibrating screens range from the multiple-deck, heavy-duty 5- x 14-ft models down to 2- x 4-ft. single-deck types. Also expanded and improved is the line of chain-and-flight conveyors of the drag type. It is reported that new models have been developed to handle the hot lightweight aggregate products under temperatures that make belt conveyors impossible to use.

Surface Thermometer

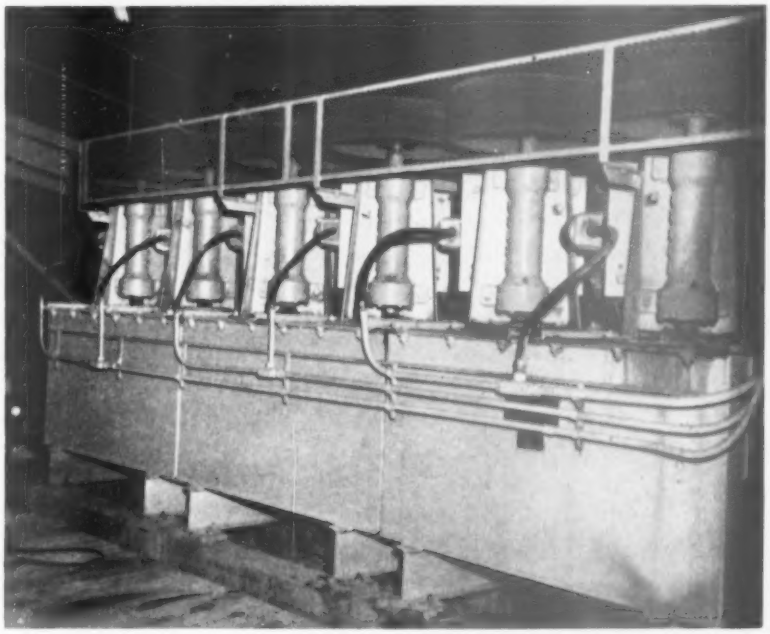
PACIFIC TRANSDUCER CO., 11921 W. Pico Blvd., Los Angeles 64, Calif., has announced the development of a surface thermometer for checking the outside temperature of pipes, plastic dies and rubber molds; for electric motors and cylinder blocks, etc. The company reports that the thermometer has been designed to produce an essentially unilateral thermal instrument which indicates the temperature from the back of the instrument only. The range is 0 to 300 deg. F. calibrated in 2 deg. increments, and the unit is 2 in. in diameter and weighs 1 oz.

Valve Seal

RODIC CHEMICAL AND RUBBER CORP., Allen Ave., New Brunswick, N. J., has announced production of its Rand seal, said to operate on a new principle which makes possible a valve that is leakproof, long-wearing, easier to operate and comparatively inexpensive to manufacture. The company states that essential operation is based on working with, rather than against, the fluid flow, thereby eliminating leak-inducing permanent deformation found in previous designs based on the compression of a resilient member against a nonresilient seat. The seal is adaptable to many present designs of valves and other devices for the control of fluid and gas flow.



Cone-shaped seal



Six-celled attrition machine

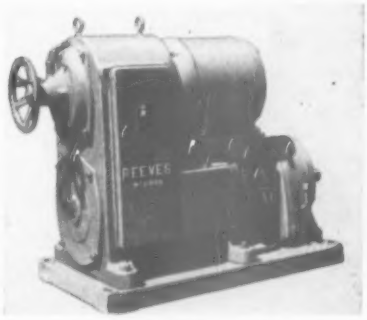
Attrition Machine

WESTERN MACHINERY CO., 760 Folsom St., San Francisco 7, Calif., has announced its attrition machine, a metallurgical and industrial processing tool. The machine's operating principle is based on the controlled turbulence of high density pulps, with the resultant action simulating the rubbing of particle against particle. The machine is made up of two, four or six octagonal shaped cells operating in series, and mounted on a common base. Each cell includes a motor driven vertical impeller shaft with three, six-bladed impellers. Pitch of the impellers is alternated, and rotation in the cells is clockwise.

Diesel-Powered Compressor

CUMMINS ENGINE CO., INC., Columbus, Ind., is furnishing diesel power for the Standard Model 365 air compressor, manufactured by The Jaeger Machine Co. of Columbus, Ohio. The compressor, rated at 365 c.f.m. at 100 p.s.i., utilizes a 165-hp. Model HRBI-600 Cummins diesel for its power plant. Engine operating speed of this diesel-compressor unit is 1240 r.p.m. The engine is a six-cycle full diesel; with a displacement of 743 cu. in., a compression ratio of 15.5:1, a maximum rated r.p.m. of 1800, and a net weight of 2365 lb.

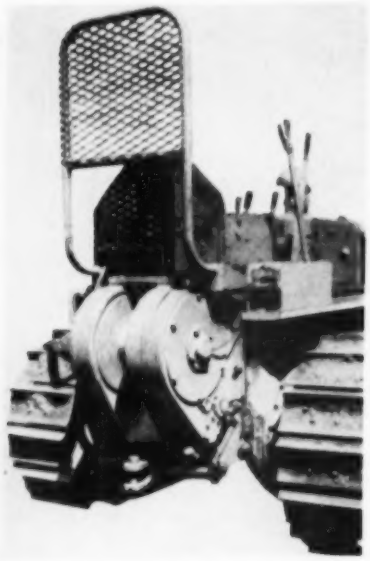
Diesel-powered air compressor



Drive of 25-hp. capacity

Variable Speed Drive

REEVES PULLEY CO., Columbus, Ind., has in production a new size Vari-Speed Motodrive, designated as Model No. 8000. The unit has a capacity of 25 hp. and is available in all speed ranges from 2:1 to 6:1. This self-contained power unit is offered in horizontal and vertical designs. Handwheel control is standard, but electrical or completely automatic hydraulic controls are also available. A tachometer, calibrated to the user's specifications, may also be attached.



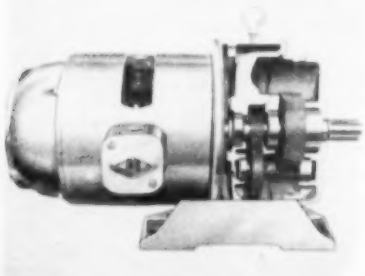
Lightweight tractor winch

Tractor Winch

HYSTER CO., 2902 N. E. Clackamas St., Portland 8, Ore., has developed its new D4 HySpeed winch designed to supply the demand for a lightweight, free-spooling winch with fast line speeds and quick positive brake action. The winch can be mounted on either seat or fender tank-type Caterpillar D4 tractors.

Fluid-Drive Gear Reducer

REULAND ELECTRIC CO., Alhambra, Calif., has designed a single unit, consisting of its standard fluid-shaft motor and gear train, for the purpose of converting the motor's conventional high-speed into a slow-speed, high torque output. It is said that the integral fluid coupling provides cushioned starting of heavy loads and protection against jamming of equipment. Features include: short lever arm length, said to minimize torsional stress; oil bath; and helical gears. All of the gear reducers are available in either drip-proof or totally-enclosed designs, with output speeds from 1 to 600 r.p.m.



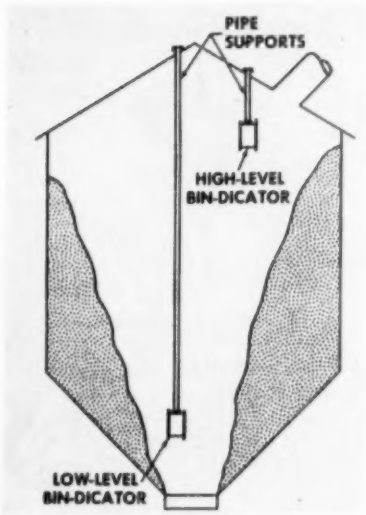
Gear reducer with internal fluid coupling

1952 Truck Line

CHEVROLET MOTOR DIV., General Motors Building, Detroit 2, Mich., has announced production of its line of trucks for 1952, with gross vehicle weights ranging from 4100 to 16,000 lb. According to the company, improvements have been made, including: more efficient carburetion, and redesigned cab door lock pillars and newly positioned striker plates which permit the use of push button door locks. The trucks are powered by either of two valve-in-head engines, the 92-hp. Thriftmaster or the 105-hp. Loadmaster. The company has retained in the chassis, synchro-mesh transmissions, braking systems designed for varied load conditions and hypoid rear axles.

Bin-Level Indicator

THE BIN-DICATOR CO., 13946-48 Kercheval, Detroit 15, Mich., has announced a special model bin-level indicator, known as Model CS, designed for suspended installation from above. The unit is made to be drilled and tapped to take any size pipe up to 2 in., and the support pipe accommodates electrical wiring, making conduit unnecessary. Because of the manner of mounting, the installation may be moved to operate at different levels.



Sketch of bin-level indicator installation

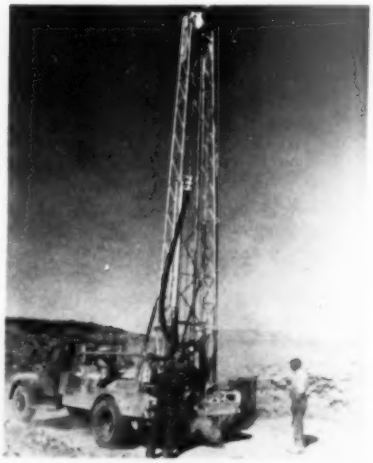
Triple Roll Crusher

PIONEER ENGINEERING WORKS, INC., 1515 Central Ave., Minneapolis 13, Minn., has added to its line a 54- x 24-in. triple roll crusher, a larger version of the 40- x 22-in. and 30- x 18-in. crushers which have been available for some time. Stage of reduction varies from 6½ to 2 in., when producing minimum sizes from 4 to minus ¼ in., respectively. It is reported that nominal production will vary from approximately 35 t.p.h. of minus ¼ in. to 500 t.p.h. of minus 4 in., based on material weighing 2700 lb. per cu. yd. This triple roll crusher is available either for stationary or portable installations.

Stationary or portable triple roll crusher

Compressed Air Drill

WINTER-WEISS CO., 2201 Blake St., Denver 2, Colo., has manufactured a mobile, rotary air-blast drill, known as the Portadrill, which is an adaptation of a standard seismograph truck-mounted, rotary rig. An air compressor, mounted as an integral part of the drill, replaces the standard mud pump. Drill cuttings are blown out of the hole by a large volume of air furnished under low pressure. While maximum pressure for cutting removal is reported to run as high as 40 p.s.i., the normal operating pressure ranges from 11 to 16 p.s.i. The drill is mounted on a standard truck chassis with a 145-hp. engine.



Portable air blast drill

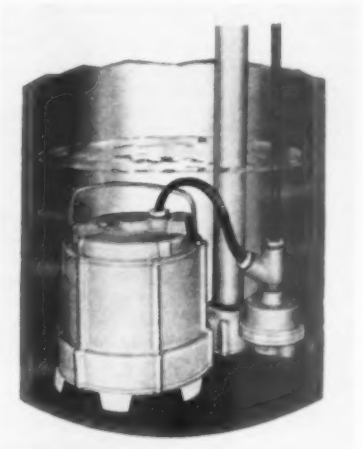
pH Meter

NORTH AMERICAN PHILIPS CO., INC., 750 S. Fulton Ave., Mount Vernon, N. Y., has announced the availability of its Universal pH meter, which is precision built for reliable service and quick, accurate measurements of hydrogen-ion concentrations. The new instrument is designed for all pH and rH work, for potentiometric titrations and for oxidation-reduction-potential investigations. It provides a measuring accuracy of 0.01 pH or 0.5 mv., a range of 0-14.15 pH and 0-1415mv., currentless measuring with no phenomena of polarization, zero indication by cathode ray tube, can be used with glass, quinhydrone, hydrogen and platina electrodes, and is direct calibrated for the first three.

Meter designed for pH and rH work

Utility Pump

KENCO, INC., 1125 N. Ridge Road, Lorain, Ohio, has announced its utility pump, said to be completely submersible because of its patented automatic liquid level control switch, which eliminates the need for a float. In addition to sump usage, this portable pump has other purposes such as draining flooded areas, pumping out new excavations and ditches, and draining tanks and vats. The pump is of bronze construction, 9½ in. high, with a maximum diameter of 13 in. It is both manual and automatic, has a capacity of 3300 g.p.h., and is driven by a ⅓-hp. motor.



Submersible, portable utility pump

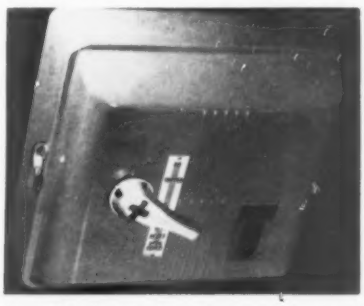
Portable washing plant

Portable Washing Plant

LIPPMANN ENGINEERING WORKS, 4603 W. Mitchell St., Milwaukee 14, Wis., has developed a Wash-More portable washing plant, embodying features of the previous plant with the addition of a catwalk for access to all parts of the machine. This plant uses mesh-type screen guards to supplant the solid heavier type, formerly used. The capacity of the plant is said to run as high as 80 cu. yd. per hr., and is portable for mobile operations.

Combination Starter-Breaker

WESTINGHOUSE ELECTRIC CORP., Box 2099, Pittsburgh 30, Penn., has announced as available a combination across-the-line motor starter with circuit breaker, in which the components are mounted side-by-side. This starter is available in Sizes 0, 1 and 2 in sheet-steel enclosures for NEMA Types I, IA and V. Modifications such as built-in control circuit transformer, control relay and inductive shunts can be supplied on special order.



Across-the-line motor starter with circuit breaker

Motor Control Center

GENERAL ELECTRIC CO., Control Dept., Schenectady 5, N. Y., has announced a motor control center for use wherever two or more a-c motors, up to 200 hp., 600 volts, are controlled from a central location. According to the company, it provides a simplified method of installing and servicing in a central location a-c combination motor starters in NEMA sizes 1 through 5, as well as lighting panels and associated equipment for a group of motors. The center is designed to withstand short circuit stresses up to 25,000 amp.

Details of motor control center

N. A. L. I. Charts Aggressive Program to Widen Markets

First convention of merged national associations sets up activities to emphasize sales promotion and soil conservation; sessions also covered plant operation and legislation

THE FIRST CONVENTION of the National Agricultural Limestone Institute, held January 15-17 at Hotel Statler, Washington, D. C., had a record attendance of producers and a total registration just short of 500. It was the first meeting since the merger of the Agricultural Limestone Institute and the National Agricultural Limestone Association.

Members from both of the previous associations, now dissolved, were well represented in the registration and the new association was given an enthusiastic send-off. A substantial percentage of total tonnage nationally is produced by the companies represented at the convention. Being a new organization, this first convention set the pattern for a program of activities to best fit the needs of the industry, and its objectives as set forth apparently were well received. Promotional activities, which were given most emphasis by the A.L.I., as its principal activity, and legislative activities with respect to federal soil conservation appropriations, which were stressed to a greater extent by the N.A.L.A., will be given equal consideration in the long-range program of the new N.A.L.I. The budget provides equally for these two principal activities and the objective is more of both, as membership is increased to provide funds necessary to carry forward a widely expanded program.

It was agreed that the industry has not done nearly the job of sales promotion that is required in view of the fact that peak tonnage of agricultural limestone spread in a year, of some 30 million tons, is far short of the 80 million tons potential which is now the estimated minimum requirement for the nation's soils. In recognition of this market and because soil conservation appropriations cannot be guaranteed to continue at favorable levels, it was the consensus of the convention that the promotion of sales to the farmer must be given increased emphasis. A membership drive is to be accelerated with the view of increasing revenue in order to undertake an expanded program.

The convention was preceded by committee meetings and a meeting of the board of directors and, in addition, other committee meetings were conducted concurrently with the convention to thresh out pressing problems. The result was that a workable and sound program of association functions was completed, with little deferred for future action, which was acceptable to members regardless of their prior affiliation.

Officers of the new National Agricultural Limestone Institute are (l. to r.) K. K. Kinsey, Concrete Materials and Construction Co., Cedar Rapids, Iowa, first vice-president; Robert M. Patton, New York Coal Sales Co., Columbus, Ohio, president; and Verne Morgan, Kentucky Stone Co., Louisville, Ky., treasurer

Officers

Robert M. Patton, Plum Run Stone Div., New York Coal Sales Co., Columbus, Ohio, was elected president of N.A.L.I. Mr. Patton had been active in the affairs of the N.A.L.A. and was an enthusiastic supporter of the merger.

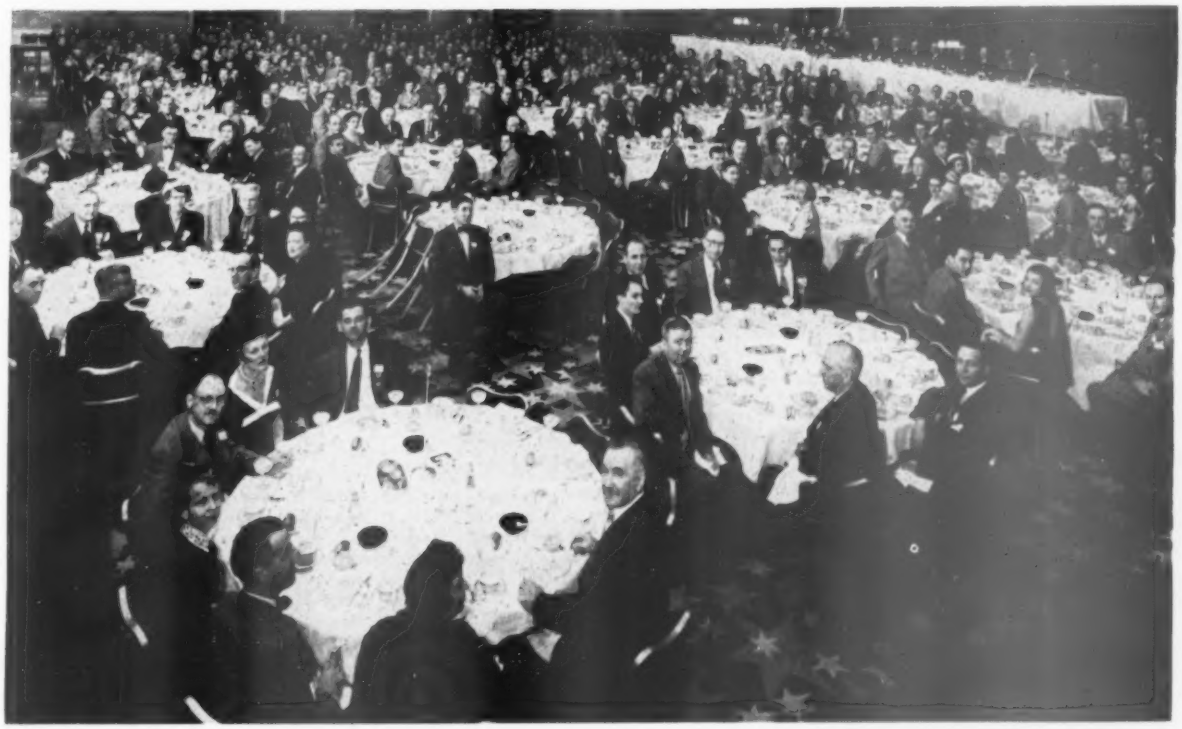
K. K. Kinsey, Concrete Materials and Construction Co., Cedar Rapids, Iowa, was elected first vice-president; Robert M. Koch, Washington, D. C., executive secretary; and Verne C. Morgan, Kentucky Stone Co., Louisville, Ky., was elected treasurer. Messrs. Kinsey and Morgan were formerly identified with A.L.I. and Mr. Koch had served as executive secretary of N.A.L.A.

Five regional vice-presidents were elected as follows: Harry E. Battin, Jr., South Bethlehem, N. Y.; Joseph J. Griesemer, Billings, Mo.; N. E. Kelb, Indianapolis, Ind.; C. M. Kirtley, Des Moines, Iowa; and J. Larry Fay, Chicago, Ill. One of the matters brought up for discussion and later consideration was the revision of the regions for better equalization of tonnages and members. Regional vice-presidents have the responsibility to promote and further the interests of the association within the respective regions and they constitute the nominating committee.

According to the bylaws, the executive committee consists of the president, the first vice-president, the immediate past president and eight members of the board of directors. Each region is represented by at least one member on the executive committee.

Elected to the executive committee were Harry E. Battin, Jr., Callanan Road Improvement Co., South Bethlehem, N. Y.; Harry Clark, Consumers Co., Chicago, Ill.; Horace Krause, Columbia Quarry Co., St. Louis, Mo.; John Riddle, Riddle Quarries, Inc., Marion, Kan.; Arthur Alvis, Butler, Mo.; Earl Heckathorn, Stunz-Yeoman Co., Inc., Delphi, Ind.; Clarence Munz, Eastern Rock Products, Inc., Utica, N. Y.; and N. G. Farber, Farber White Limestone Co., Franklin, N. J.

Since there was no immediate past president, the two co-chairmen who served from the time of incorporation until the meeting, were elected to the executive committee. They are P. E.



More than 100 Congressmen and other government officials were guests of the industry at the National Agricultural Limestone Institute annual convention banquet

Heim, past president of A.L.I. and Vincent H. Shea, past president of N.A.L.A. Both men were given an enthusiastic ovation by the convention for their efforts in many committee meetings which led to the merger of the two former associations into the N.A.L.I.

Sixty directors were elected to serve in 1952, 30 of whom were named from each of the former two associations. For the year 1953 and thereafter, the board of directors will consist of not less than 20 members nor more than 40 members to be elected from the active membership.

Directors for 1952 are: Arthur Alvis, Butler, Mo.; Alvin R. Armbrust, Washington C. H., Ohio; Harry E. Battin, Jr., South Bethlehem, N. Y.; W. S. Black, Quincy, Ill.; Michael Brisch, Manitowoc, Wis.; C. A. Broecker, Kentland, Ind.; W. F. Childs, III, Towson, Md.; Harry A. Clark, Chicago, Ill.; William J. Clark, Munnsville, N. Y.; W. Ray Clark, Plattsburg, Mo.; Charles Coburn, Waukesha, Wis.; R. D. Davis, Sparta, Tenn.; John M. Deely, Lee, Mass.; W. D. Dillon, Columbus Junction, Iowa; James Eells, Cleveland, Ohio; L. R. Falk, St. Ansgar, Iowa; N. G. Farber, Franklin, N. J.; J. L. Fay, Chicago, Ill.; Leonard Fry, Mercersburg, Penn.

Herbert C. Gray, Tulsa, Okla.; Merrill M. Green, Carrollton, Mo.; Maurice H. Greenberg, Joliet, Ill.; A. K. Hausmann, Cleveland, Ohio; Earl L. Heckathorn, Delphi, Ind.; Philip E. Heim, Lowellville, Ohio; D. H. Henderson, Hamilton, Ontario, Canada; W. E. Hewitt, East St. Louis, Ill.; Earl P. Holwadel, Cincinnati, Ohio; William E. Horne, Newton, N. J.; Russell W. Hunt, Neosho, Mo.; K. K. Kinsey, Cedar Rapids, Iowa; Horace C. Krause, St. Louis, Mo.; Richard Lutz, Oshkosh, Wis.; W. H. Margraf, Columbus, Ohio; R. E. Meshberger, Columbus, Ind.; Floyd Millen, Farmington, Iowa; Verne C. Morgan, Louisville, Ky.; J. B. Mount, Shouns, Tenn.; Clarence A. Munz, Utica, N. Y.; J. E. Ott, Bay Port, Mich.

Robert M. Patton, Columbus, Ohio; Robert J. Pleasant, Tulsa, Okla.; T. C. Pollock, Burlington, Vt.; Russell C. Prall, Milroy, Ind.; John R. Rice, Buchanan, Va.; Charles Rich, Swanton, Vt.; John H. Riddle, Marion, Kan.; Fred Roberts, Norristown, Penn.; Barney T. Scharbach, Essexville, Mich.; Robert H. Schneckloth, Lowden, Iowa; R. M. Seifried, Findlay, Ohio; John J. Stark, Girard, Kan.; W. J. Stoeffel, Chicago, Ill.; W. E. Stone, Piqua, Ohio; Burt F. Taylor, Cowan, Tenn.; David P. Thomas, Fort Scott, Kan.; J. H. Wagner, Meadowview, Va.; F. Grove White, Stephens City, Va.; F. E. Wholaver, Bellefonte, Penn.; and Myron J. Wurtenberger, Lockport, N. Y.

Robert M. Koch, executive secretary of N.A.L.I.

Program

The convention opened with an all-day meeting of the board of directors and practically the entire slate was present. Officers and members of the executive committee were elected in this meeting, and the bylaws were discussed. Reports of the committees on promotion and the budget were heard, and executive secretary Robert Koch presented his report. The programs for promotion and legislative activity for the current year were thoroughly considered. Then followed a discussion of the budget, dues formula and percentage depletion. The mid-year meeting was set for June 3 and 4 at the Sheraton Hotel, Chicago, Ill.

General sessions thoroughly covered the subjects of sales promotion, plant

Left: (l.to r.) Darr W. Stock, Jr. and Neil VanBuskirk, both of Taylor Lime & Stone Co., Middleburg, Penn.; K. K. Kinsey; Nick Farber and Dana G. Farber, both of Farber White Limestone Co., Franklin, N. J., interrupt their discussion to pose for a picture. Right: Enjoying an informal get-together are (l. to r.) Harry E. Battin, Jr., Callanan Road Improvement Co., South Bethlehem, N. Y.; Mrs. W. S. Cole; Representative W. Sterling Cole of New York; Mrs. Harry E. Battin, Jr.; Louis Dushek, Callanan Road Improvement Co.; and Mrs. Louis Dushek

operations and legislative activities.

President-elect Robert M. Patton presided over the opening general business session. Following the call to order by the president and the reading of the minutes of the previous meeting, the treasurer's report was read. Then followed reports of the chairmen of committees for finance, membership, legislative and percentage depletion. The executive secretary's report concluded the session.

Mr. Patton introduced the other new officers and members of the executive committee.

Treasurer Verne Morgan, in reporting for the budget committee, announced the schedule of dues for the several classifications of memberships. Dues for active members were set at $4 per $1000 of plant bulk sales in 1951 with a minimum of $50 and no maximum. Truckers and distributors will be eligible for associate membership at $10 per truck with a $25 minimum. Suppliers to the industry, including equipment manufacturers, are eligible for associate membership at $100 per firm for those active over the entire country or a large part of it and the dues are $25 for local suppliers. A full-page advertisement in the annual convention program is available to this class of membership at $25.

An annual budget of $47,930 was approved for 1952 which includes salary adjustments upward in line with increases made in the Washington area and the salary for an additional clerk-stenographer. While this budget is based on dues of $4 per $1000 of plant bulk sales, it was pointed out by president Patton that the directors had, by a large majority, expressed a preference for a higher budget based on a $5.50 rate which would provide for a specialist in promotion and his necessary expenses. Sentiment definitely was in favor of more sales promotion but the lower budget was nevertheless adopted because of commitments in some companies which were based on the lower rate.

An operating fund to expedite the financing of yearly operations, made necessary because incoming dues might not be timed at the rate of expenditures, was established and all members have the opportunity to contribute. The N.A.L.A. previously had such a fund which was set up for a suggested limit of $10,000.

Secretary's Report

Secretary Robert Koch, in his report, gave emphasis to the outlook for operations in 1952. General business conditions are expected to be good since the government has some $50 billion of funds yet unspent. Business for farmers is expected to be excellent at least for the first half of the year. Superphosphate, which is the greatest competitor of agricultural limestone for the conservation dollar, is expected to be short in supply through 1952. P.M.A. funds are slated for a 10 percent reduction from the over-all appropriation due to increased administrative costs and the appropriation for 1953 as requested by the president was to be $256.5 million. Mr. Koch suspects that there may be attempts in Washington to cut out percentage depletion allowances which were recently granted the industry.

An expanded promotional campaign will tie in with the National Grasslands Program to encourage increased use of agricultural limestone by the nation's farmers. The current estimate of the minimum national requirement for agricultural limestone is 80 million tons annually to insure production of food and fiber required by an expanding population and military demands. This compares with the present annual application of 30 million tons, leaving a potential of 50 million tons as a challenge to the industry.

Specific objectives in the general promotional campaign are to continue issuing news releases for newspapers, the preparation of leaflets and blotters, direct mailing pieces for farmers and the conduct of essay competitions in vocational and agricultural schools, 4-H clubs, etc. News releases are being issued currently to some 1200 newspapers and this service will be expanded as new members request that they be made available to additional newspapers in their sales area. There is no charge for the service.

Among other activities under serious consideration for use by members are radio presentations including radio-type recording service and movies. It is felt that a new movie would be desirable because of the great acceptance of the movie "The Other Side of the Fence" which has been put to good use for the past several years. Other possibilities are to have articles written by agronomists for use by the industry which would be patterned along the lines of those used by the potash industry, and the preparation of exhibit material for use at fairs. At present, there are nine leaflets available for sale to members for direct mailing to farmers. Mailing is handled by the association office.

Percentage depletion was thoroughly considered at the convention and the decision was made to have a percentage depletion committee start preparation of the industry's case for obtaining 15 percent percentage depletion. The committee comprises Earl Heckathorn, William E. Horne, Charles Rich, Vincent Shea and chairman Horace Krause. Mr. Koch and the committee, since the convention, have met with officials of the Bureau of Internal Revenue and it was the opinion of these officials that every producer who thinks he is entitled to 15 percent percentage depletion should claim that amount when filing his return. A statement in support of the claim should be attached to the tax return. The committee will develop additional information and suggestions for the guidance of individual companies in filing their returns.

Before this action was taken, it had been brought out in discussion that a producer could claim the highest possible percentage depletion which is reasonable without fear of penalty in the event the Bureau of Internal Revenue disallows his claim. In such event, however, there would be interest charges. On the other hand,

if a producer is later proved to have been entitled to a higher allowance than filed, he cannot reclaim the difference.

According to the ruling as issued, a 5 percent deduction from gross income from the property is permissible for crushed stone operations, 10 percent for calcium and magnesium carbonates and 15 percent for chemical and metallurgical grade stone. A point brought out in discussion was that chemical and metallurgical grade stone should not necessarily only mean stone high in carbonates because stone high in silica, for example, might be so classed because of its use, for example, in rock wool or cement manufacture.

State Specifications

Earl Heckathorn mentioned a resolution adopted in Indiana that would set up specifications for agricultural limestone to establish quality grades for the protection of customers. It had been claimed that there were "no standards for chemical composition or size." There was much discussion of the subject of such specifications and the question was whether it was feasible to follow a law rather than comply with standards as set forth by institutions that are closely familiar with requirements. The subject will come up for further discussion at the summer meeting.

Liming for Grasslands

Verne C. Morgan presided for the second session at which there were talks on liming requirements and pricing practices.

Dr. Samuel R. Aldrich, extension agronomist, Cornell University, spoke on the subject "Lime in a Grassland Farming Program." He first covered the subject geographically by regions, telling the conditions and requirements for a sound grasslands program over the nation. In the Rocky Mountain states erosion poses a problem of management whereas in the South and Southeast a change in the agricultural system is needed whereby more acres of land will be proportioned for grass and livestock. Improved grasses and better pastures are the goal in northern states. The over-all program is to give proper recognition to the value of grasses.

Nearly all liming is needed in the humid states as contrasted to the arid states. In the deep South, much of the lime has been leached out over the years.

Dr. Aldrich summed up the principal benefits from liming, among them being to raise the pH, reduce aluminum and manganese which may be toxic to plants, increase the availability of phosphorus, accelerate microbial action and to release nitrogen from organic matter.

He then touched upon methods of application for effective results. He advocates application through the plow layer into the immediate subsoil. As a top-dressing, he said that liming material is much more effective when worked into a depth of 3 in. than it would be for 6 in.

President-elect Robert M. Patton and Mrs. Patton (Mary Lou) made a charming couple

Economics of liming were discussed and his figures showed that the cost of liming materials and fertilizers had increased modestly in price over the years when compared with other cost factors.

Lack of liming materials is the number one limiting condition in growing grasses. To show the value of liming, he said that a ton of liming material spread at a total cost of $8 per ton will realize $75 in yield of grain. These figures were based on his research.

Dr. Aldrich then told of efforts to increase the application of liming materials in New York that have been successful in a 20 percent increase in 1951 over the previous year. Dealers are selling liming materials over the counter along with seed, and summer application is being stressed. Every agency concerned with agriculture has been enlisted in the drive including county agents, dealers, lime distributors and P.M.A. representatives. Some 4000 farmers were contacted during the past winter and the general public is being sold on the benefits of liming.

Bulk spreading was first introduced in 1946 and the practice is growing fast. He said that the future of the industry depends upon further development of bulk spreading. There were no spreaders operating in New York in 1945, a few were in use in 1946 and, in 1951, there were some 175 spreader trucks in operation. To provide the necessary profit incentive for truckers, he emphasized the necessity for providing stability so that there will be no wide fluctuations in volume. He showed a soil testing kit and recommended that more use of such equipment be encouraged.

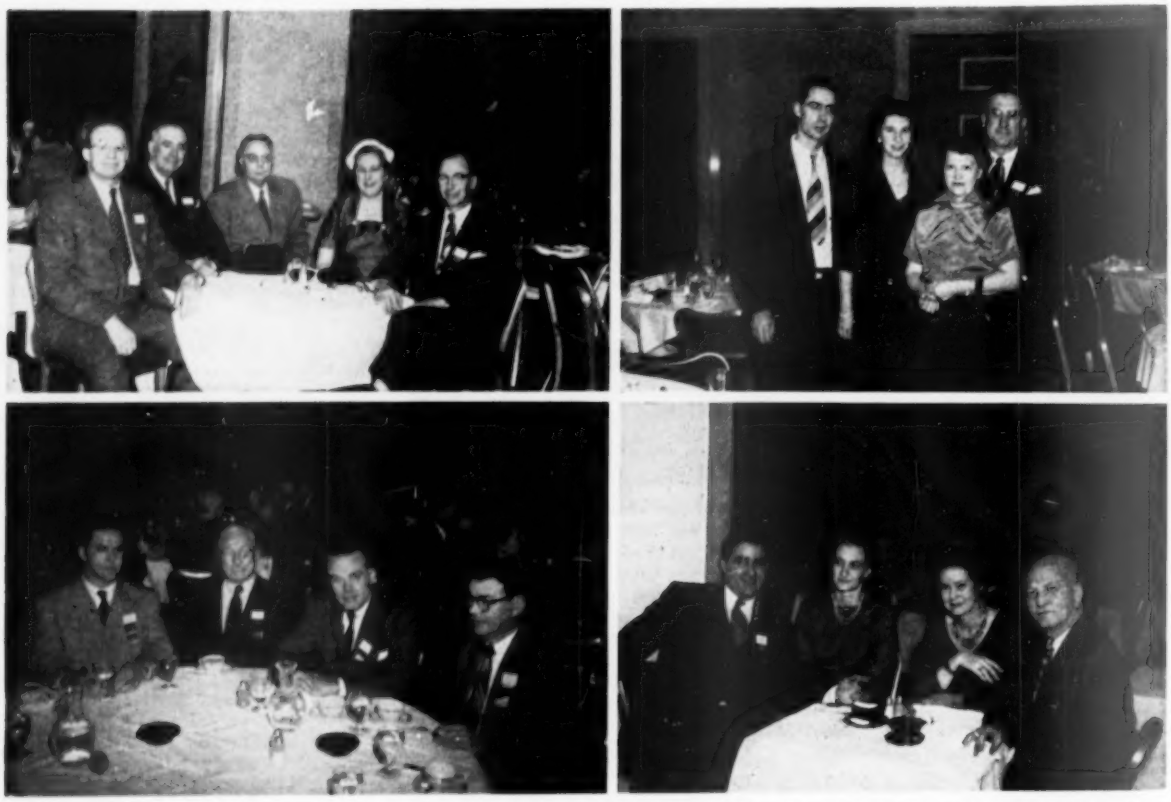
Pricing

"Price Stabilization and the Agricultural Limestone Industry" was the subject of a talk by Henry A. Huschke, chief, Agricultural Chemicals Section, Office of Price Stabilization.

Mr. Huschke's remarks were mainly about regulation CPR-77 which became effective October 1, 1951, and which is a tailored regulation to provide some measure of relief to agricultural limestone producers who need price relief. The General Ceiling Price Regulation, made effective January 26, 1951, which froze prices at the highest prices charged during the base period December 19, 1950, to January 25, 1951, had applied for agricultural limestone until the new regulation was issued and still governs the ceiling prices of everything sold by the crushed stone and lime industries except agricultural liming methods.

CPR-77 governs the ceiling prices of agricultural liming materials at all levels including the producer, the wholesaler, the retailer and the truck-

N.A.L.I. officers and directors for 1952 include (l. to r.) Arthur Alvis, Butler, Mo., director; K. K. Kinsey, Concrete Materials and Construction Co., Cedar Rapids, Iowa, first vice-president; Horace C. Krause, Columbia Quarry Co., St. Louis, Mo., director; Clarence A. Munz, Eastern Rock Products, Inc., Utica, N. Y., director; Robert M. Patton, Plum Run Stone Division, New York Coal Sales Co., Columbus, Ohio, president; Earl L. Heckathorn, Stuntz-Yeoman Co., Delphi, Ind., director; John H. Riddle, Riddle Quarries, Inc., Marion, Kan., director; Harry A. Clark, Consumers Co., Chicago, Ill., director; N. G. Farber, Farber White Limestone Co., Franklin, N. J., director; Harry E. Battin, Jr., Callanan Road Improvement Co., South Bethlehem, N. Y., director; and Verne C. Morgan, Kentucky Stone Co., Louisville, Ky., treasurer



Snapped at the banquet. Upper left: (l. to r.) Director Charles Coburn, Waukesha Lime & Stone Co., Waukesha, Wis.; Ray Cook, Ray Cook Construction Co., Ames, Iowa; Director Philip Heim, The Carbon Limestone Co., Lowellville, Ohio; Mrs. J. L. Fay and Director J. L. Fay, Material Service Corp., Chicago, Ill. Upper right: (l. to r.) Mr. and Mrs. E. D. Kelb, Cumberland Quarries, Indianapolis, Ind.; Mrs. Russell Prall and Director Russell Prall, Rush County Stone Co., Milroy, Ind. Lower left: (l. to r.) Dana G. Farber, Farber White Limestone Co., Franklin, N. J.; William E. Horne, Limestone Products Corp. of America, Newton, N. J.; William Beck Widnall, representative of the 7th District of New Jersey in Congress; and W. C. Varey, Containers and Packing Div. of N.P.A., Silver Spring, Md. Lower right: (l. to r.) Mr. and Mrs. Preston Archibald, Mrs. Harry E. Battin, Jr., and Director Harry E. Battin, Jr., from Callanan Road Improvement Co., South Bethlehem, N. Y.

er. A producer is given a choice of two methods of establishing his ceiling prices for bulk material f.o.b. his plant. He may elect to keep his ceiling price as established under the general ceiling price regulation. The alternative is to compute a new ceiling by adding to the base period price the increase in production cost experienced between the two six-month periods January-June, 1950, and January-June, 1951. The base period price is the highest price charged each class of purchasers during the January-June, 1950, period.

One section of the regulation permits a producer of bagged agstone to add to his bulk f.o.b. plant ceiling price, the customary differential he charged for bagging during the base period and the current cost of bags, or the cost of the bags on June 30, 1951, whichever is lower.

Where a producer makes sales from a stockpile or railroad siding not in the vicinity of the plant, the ceiling price is determined by adding to the bulk f.o.b. plant price an amount equal to the cost to him of handling and transporting the material from the plant to the stockpile or railroad siding.

In the case of sales on a delivered or delivered-and-spread basis, the f.o.b. plant price is the starting point in establishing the ceiling price. The producer next determines his customary differential, if any, during the base period (January-June, 1950) and adds that sum to the f.o.b. plant or stockpile price. To this also may be added the increase in cost of transportation and handling over the average of such cost during the base period. The sum of these becomes the ceiling price.

A producer must report ceiling prices per ton for each type of sale and to each class of purchaser to O.P.S. in Washington within 60 days after October 1, 1951. Those producers who have not done so, were urged to report this information to O.P.S. immediately.

One section of the regulation applies to nonproducers of agricultural liming materials including wholesalers and retailers and truckers who buy material from producers and sell it to farmers. It permits the wholesaler or retailer to add to the ceiling f.o.b. plant or delivered price he pays the producer for the materials, his cost of transportation, handling and spreading and his base period (January-June, 1950) percentage markup.

Another section applies to new sellers of agricultural liming materials, those who start operations at a new point of production, or producers, wholesalers or retailers who did not sell during the January-June, 1950, base period. It states that the ceiling price be determined by adopting the ceiling of the most closely competitive seller of the same or a similar kind and grade of agricultural liming material to each class of purchaser.

For those who operate portable equipment and move from one deposit to another a special provision states that the ceiling price is the lower of the following: (a) the established ceiling at a producer's nearest other point of production or (b) the ceiling of his closest competitor who also uses portable equipment.

Regulation CPR-77 requires the maintenance of customary differentials to each class of purchaser and that the producer must keep base period and current records. It prohibits sales at prices higher than a producer's established ceiling but permits sales below these ceilings. The

regulation does not govern the ceiling prices that may be charged for trucking, transportation coming under the general ceiling price regulation. Applications for an upward adjustment in trucking rates should be made to O.P.S. under the provisions of SR-39 to the GCPR.

CPR contains a formula for computing ceiling prices based upon cost increases similar to the Capehart amendment to the Defense Production Act except that inclusion of overhead as an item of cost is not permitted. Those who wish to include overhead in the computations may use GOR-20 or GOR-21, General Overriding Regulations. Applicable forms are to be filed with a producer's O.P.S. district office with the exception that those with net incomes exceeding $1,000,000 must submit forms to O.P.S. in Washington.

Promotion

K. K. Kinsey presided over a session that was devoted entirely to a discussion of sales promotion. The industry is showing greatly increased interest in sales promotion and this session was one of the best ever held on the subject.

A panel of five producers, each of whom is a leader in a specific aspect of sales promotion, led the discussion and answered questions directed to them. Subjects covered were the use of company-employed agronomists, billboard advertising, radio, direct mail, advertising media and newspaper advertising.

Harry E. Battin, Callanan Road Improvement Co., South Bethlehem, N. Y., led off by telling how his company makes effective use of the services of an agronomist hired by the company. The decision to hire an agronomist was based on the successful experience of Fry Coal and Stone Co., Mercersburg, Penn., which was reported at the annual convention of N.A.L.A. in January, 1950 (See ROCK PRODUCTS, March, 1950, page 102 and April, 1950, pages 103-107).

Since employing a graduate agronomist from Cornell University, Mr. Battin's company has greatly expanded its promotional activities. A program of advertising is conducted in county weekly and monthly papers inviting farmers to request the company's soil testing service. During 1951, the agronomist visited 177 farms personally to discuss what was needed to increase soil productivity. About 75 percent of the requests for soil tests were traceable to the advertisements.

The company has been exhibiting at county fairs for the past two years and has its own display. Use is made of movies and the agronomist attends grange meetings, those of vegetable growers and other farm groups. The company has demonstration plots on its own farm which are used in the education of future farmers. It is a regular practice to have as dinner guests, county agents and their wives.

The trend in the experience of this company is away from sales tied to the government program.

Principal discussion was about soil testing as required in various states and the opinion was expressed by several producers that required testing has had the adverse effect of delaying the application of agricultural limestone. Some producers with testing services also test soils for phosphate and potash, which has proven effective in building good will and increasing sales.

Robert J. Pleasant, Anchor Stone and Materials Co., Tulsa, Okla., who has had great success with radio advertising, discussed his program. Mr. Pleasant has used the radio for six years, starting with spot announcements for the first year. He now sponsors a 30-min. news program from 12:15-12:45 p.m. each Sunday. His advertising program is based on selling health and the need for the public buying food on the basis of its quality and food value.

Mr. Pleasant then introduced Sam Schneider, radio farm director of station KVOO, Tulsa, Okla., who gave an inspiring presentation on promoting sales of agricultural limestone.

In Mr. Schneider's opinion, an effective approach is to sell a whole system of agriculture based on health. As he expressed it, people are the final product of our agriculture, and it is up to the industry to interpret its story in relation to human health.

He pointed out that our population continues to increase faster than our production of food, that 60,000 new faces are added each day, which means that production of food must be stepped up accordingly from existing farm acres. Whereas five people had to depend upon the output from an acre of land not so long ago, each acre will have to supply the requirements for 15 people by 1980. Crops must be increased in terms of 50 percent during times when more and more farmers are leaving for the cities, which will require more mechanization of all farm activities.

As far as radio is concerned, he said that 85 percent of the farmers in the Midwest have radios. They have more radios than beds and spend ten times as much time listening to the radio as they do in reading.

By advertising, and tying it to health and foods, agricultural limestone is given class, he said, and opportunity is provided to tie in with community activities and the obligations to society.

A number of questions were asked with regard to the program. This radio program covers 100 counties and reaches about 250,000 people. The company operates over a 75-mile radius. A Sunday program is preferred because it is considered important to reach city people as well as farmers. The record shows that 75 percent of sales are to people who live in the city but own out-lying farms. Cost of the advertising is from 1 to 2 percent of gross sales.

Producers of agricultural limestone in Iowa have a progressive program of billboard advertising which was discussed by Floyd H. Millen, Valley Limestone and Gravel, Inc., Bonaparte, Iowa.

Mr. Millen said that, in his experience, billboard advertising has proved more effective than newspaper advertising. The billboard idea was developed after much discussion with an artist, and an effective series has been prepared. Typical catch lines are tied to the building of strong bodies and teeth, the idea of liming throughout the year, stressing the time to sign up for lime, etc.

The billboards measure 12 x 25 ft. and the Brink Outdoor Advertising Co. is paid a rental of $20-$25 per month for billboard space, price de-

Members renewed old friendships and made new ones. Left: (l. to r.) Director and Mrs. Alvin Armbrust, Fayette Limestone Co., Washington C. H., Ohio; Mr. and Mrs. Edward Markwell, Auxvasse Stone and Gravel Co., St. Louis, Mo. Right: (l. to r.) E. L. Rice, Rice Brothers, Waynesburg, Penn.; Dorr W. Stock, Jr., Faylor Lime & Stone Co., Middleburg, Penn.; W. C. Gerhart, Fry Coal & Stone Co., Mercersburg, Penn.; F. E. Wholaver, Whiterock Quarries, Bellefonte, Penn.; Leonard S. Fry, Fry Coal & Stone Co., Mercersburg, Penn.; and Senator Edward Martin of Pennsylvania

pending upon the location. Cost of the posters is $14 each and practice, in Iowa, is to have the same poster in use at a given time throughout the state. Signs are good for 60 days and generally 30 of them are in use on the main highways for a given period of time.

Discussion developed that billboard advertising has proved effective in other areas. Waukesha Lime and Stone Co., Waukesha, Wis., reported that billboard advertising on a main highway at the plant is instrumental in securing many new customers.

Earl Holwadel, Ohio Gravel Co., Cincinnati, Ohio, whose company incidentally produces agricultural liming materials from high calcium gravel, explained a newspaper advertising promotional campaign that is doing an excellent job of creative selling. The advertisements carry the company's own nameplate and are carried with regularity featuring high class professional photographs taken for their educational value. One of the main objectives is to show farmers the good experiences of others as the result of liming. Other subject matter features topics of common interest to merchants and bankers, and capital is made of such slogans as the banks liking to make loans to well-managed farms, etc.

William E. Stone, Piqua Stone Products Div., Armco Steel Corp., Piqua, Ohio, who formerly had been a county agent and has had many years of direct mail experience, gave some practical ideas of how direct advertising media such as blotters, leaflets and other pieces can be put to most effective use. His company makes it a practice to take orders for fertilizers and pass that business over to truckers as an extra service.

For mailing purposes, prospect lists are obtained from dealers and kept up to date. Mr. Stone is a believer in the use of mailing pieces that are not cluttered up with figures and other information which the farmer will not read, but he uses short messages which are to the point and he features a human interest approach. Mr. Stone writes clever poetry tied in with liming on blotters which have humorous caricatures on them. He believes that the literature that has been made available through association activity is excellent but believes they would be still better if the messages were shortened and the pieces made smaller.

Plant Operations

Robert Patton presided over the operating session which featured a panel of experts on problems in quarrying, processing and distribution. The panel consisted of J. E. Jenkins, Vibration Measurement Engineers, Chicago, Ill.; A. T. Glynn, Sturtevant Mill Co., Boston, Mass.; C. W. Mayer, Bradley Pulverizer Co., Allentown, Penn.; C. L. Rosselot, Even Spread Co., Owensville, Ohio; H. A. Wendler, Highway Equipment Co., Inc., Cedar Rapids, Iowa; John Miller, Shaped Charge Explosive Manufacturers, Inc., Martinsburg, W. Va.; J. R. Lewis and W. H. Van Buren, Quaker Rubber Co.; and Fred L. White, Osgood Co., Marion, Ohio.

Mr. Jenkins has, in the past, addressed the industry on the use of the seismograph, emphasizing its application to protect producers in event of complaints from property owners who seek damage for alleged damage to their property from vibration. The seismograph has proved a useful tool for the purpose but, in this talk, Mr. Jenkins pointed to its use as a production tool to be applied in deriving economies from drilling and blasting.

Data now accumulated from some 2000 tests substantiate that there are great economies attainable from more control of blasting operations as expressed in his statement, that when blasting causes property to vibrate the producer is losing money. An article on this phase of seismographic investigation entitled "Economic Contributions of the Seismograph to the Quarry Industry" by Mr. Jenkins was published in the January, 1952, issue of ROCK PRODUCTS, pages 148-151.

Use of the drop ball and its advantages was Mr. White's subject. He believes that the preferred size of machine is a 1½-ton shovel, used as a crane, with a 60-ft. boom and 12-ft. radius. He favors a rubber-tired machine with independent boom hoist and independent travel, for ease and speed in travel over a quarry, reduced maintenance and to absorb shocks.

A nonrotating wire rope with a 6000-7000-lb. drop ball attached was recommended, the ball being 1½-2 times as long as its diameter. A machine such as he advocated would be useful, as he pointed out, in performing other work as well, including erecting jobs, handling of machinery and parts and as a clamshell.

As to capacity, a machine might break 140 or more pieces of stone per day and the operating cost might average $6 per hr. for an average of 25-30 pieces of stone broken. Comparative costs given for the drop ball versus the use of secondary drilling are in terms of ⅜ cents per ton as compared to 2 cents according to experience records quoted by Mr. White.

Larger balls than 3 or 3½ tons are more likely to break, he said, and the average life of the hoist rope is 6-8 weeks. A normal brake setting on the crane is as recommended. Whereas the ball can be dropped through an attached bucket, there are limitations as to height and accuracy that are undesirable. Rather than use a smaller machine than recommended, it was suggested that a longer boom and lighter ball be used.

An Iowa producer said that he had found a 1-ton pear-shaped ball preferable to one of 2 tons. Another operator, who uses a ¾-cu. yd. machine with a 4000-lb. ball, said that the main requirement for efficiency is to have a skilled crane operator. He uses a coil spring swivel and a ¾-in. nonrotating wire rope. Three of these wire ropes are required for an entire season.

Mr. Miller of Shaped Charge Explosive Manufacturers discussed the use of Plurajet cavity blasting units for breakage of large boulders. He mentioned the first use of shaped charges in artillery where penetration was the

Pennsylvania was well represented at the N.A.L.I. meeting. Left: (l. to r.) R. B. Garman, Tyrone Lime & Stone Co., Tyrone, Penn.; Glenn Hawthorne, Whiterock Quarries, Bellefonte, Penn.; and Fred E. Roberts, Evans-Roberts, Inc., Norristown, Penn. Center: (Front row, l. to r.) H. H. Wagner, executive secretary of Pennsylvania Stone Producers Association, Harrisburg; Philip Heim, The Carbon Limestone Co., Hillsville, Penn.; Glenn Hawthorne; Edward L. Rice, Rice Brothers, Waynesburg, Penn.; Fred E. Roberts. (Back row, l. to r.) H. H. Wagner, Jr., Adams Agstone, Inc., Hanover, Penn.; R. B. Garman; Leonard S. Fry, Fry Coal & Stone Co., Mercersburg, Penn.; and William E. Horne, Limestone Products Corp. of America, Newton, N. J. Right: (l. to r.) Edward L. Rice, Robert Stewart, Meshberger Stone Co., Columbus, Ind.; and Robert H. Schneckloth, Lowden Rock Products, Lowden, Iowa

Left: Senator George D. Aiken of Vermont, left, chats with Victor Valach, Vermarce Lime Co., Proctor, Vt. Center: Two New Englanders pause for a picture, Errol Cook, left, Hoosac Valley Lime, Adams, Mass., and Charles Rich, Swanton Lime Works, Inc., Swanton, Vt. Right: A chuckle is enjoyed by (l. to r.) Stanley P. Stabler, extension agronomist, University of Maryland, College Park, Md.; William H. Carroll, Harry T. Campbell Sons' Corp., Towson, Md.; and Samuel R. Aldrich, extension agronomist, Cornell University, Ithaca, N. Y.

objective, and developments that led to their perfection for use in secondary reduction. To cause the shattering effect required for rock breakage it was necessary to divide the explosive force or "jet" into a series of jets which would spread out in all directions upon entering the rock.

The result has been action that causes the pieces of rock to fall in place. The boulder collapses where it stands and the pieces do not fly. No mud-capping is required. Ammonium and sodium nitrates are the main explosive ingredients and standard No. 6 blasting caps or electric exploders initiate the charges. The report is sharp but said to be of short duration with little disturbance of surrounding air waves. Five sizes are available.

Among advantages claimed are minimum throw, safety features in preparing for a shot, savings in time, increased production, savings in labor and powder, reduced investment, savings by leaving equipment in place while blasting, reduced cleanup, more efficient power shovel operation and reduced manpower. Charges are merely placed on the surface of the boulder to be broken.

Two manufacturers of spreading equipment discussed improvements in their equipment. C. L. Rosselot, Even Spread Co., said that the trend toward higher grade and finer agricultural limestone has required that spreading equipment be made more efficient. He described details of the regulating gate for adjustable discharge of his company's spreader and design details to minimize segregation. A three-speed transmission with power take-off is used for accuracy, and distribution tubes are detachable.

H. A. Wendler, Highway Equipment Co., said that his spreader has two discharge discs and handles agstone, fertilizers and marl as well as crushed stone products. A hood encloses the discs and is effective in driving the agstone with some force on to the ground. He stressed the need for keeping moving parts clean and suggested the use of two parts of kerosene and one part oil for keeping the conveyor chain loose.

Sizes are 9, 11, 13 and 15 ft. and units are built up to 33 ft. in length for semi-trailer service. Bodies are of all-steel or wood construction and all-steel roller chain is used. A two-speed transmission is the means of quick changeover from handling fertilizers to agstone.

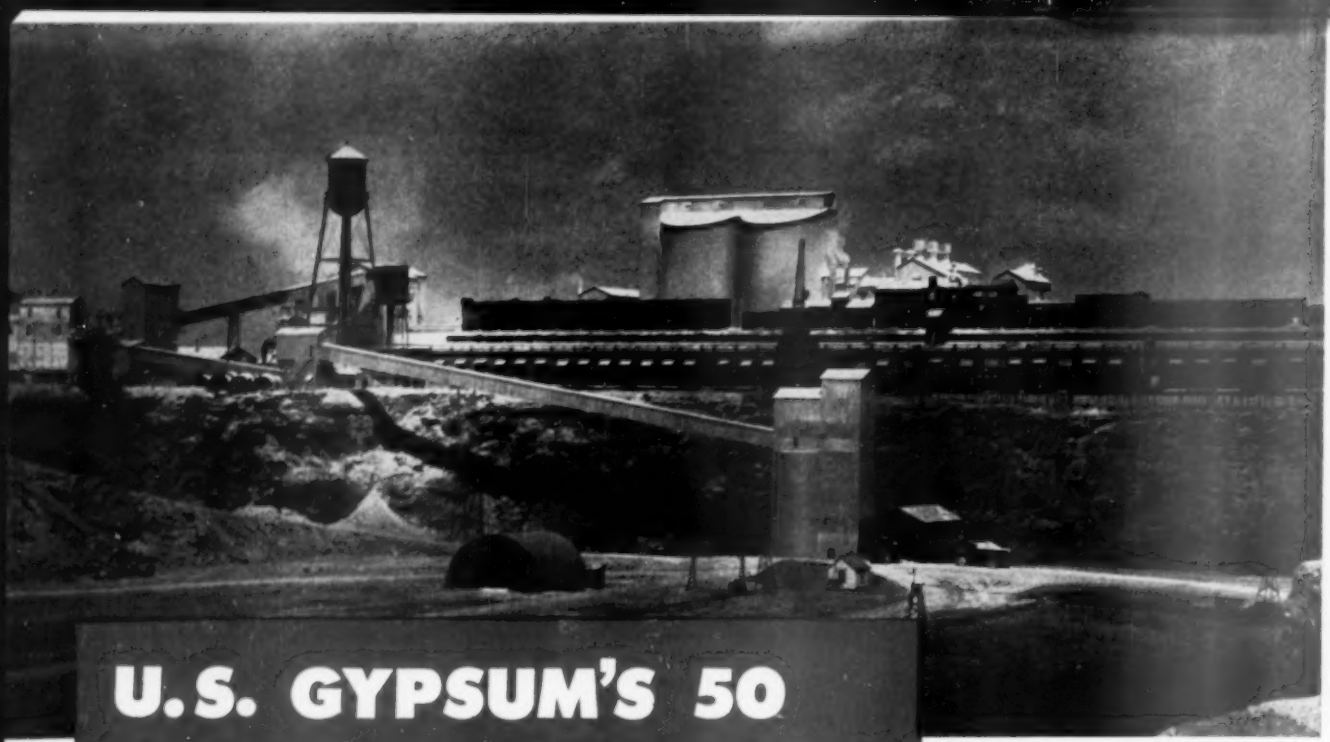
A. T. Glynn, Sturtevant Mill Co., described the operation, advantages and limitations of the ring-roll mill and other Sturtevant equipment. He commented particularly on the advantages of closed-circuit operations whereby the tailings are put through pulverizers to minimize circulating loads. Closed circuit pulverizing will build up fines, he said, in pointing to the fact that specifications in the East require higher percentages of 100-mesh material in the minus 20-mesh product.

Closed circuit operation with mechanical air separators may be applied, as well, to production of asphalt filler and simultaneous production of stone sand with agstone, he pointed out. Mr. Glynn does not advocate closing up the grate openings in mills but recommends, as an alternate practice, the use of an added mill or keeping the mill grates more "open" and operating it in closed circuit with a sizing screen. He pointed to the poor economies of operations which necessitate production of too much fines in the upper size fractions to produce sufficient fines through smaller sieve sizes in meeting specifications.

C. W. Mayer, Bradley Pulverizer Co., agreed with Mr. Glynn's ideas on closed-circuit operation, for hammer-type mills, but, for the Bradley mill, he said that the intergral mill screen should be depended upon for sizing of product. The small Bradley mill has a production range, for agstone, of 7-15 t.p.h. and the large mill has an out-

(Continued on page 132)

Left: (l. to r.) Elmer E. Hodges, Farmers Cooperative Association, Inc., Frederick, Md., chats with Samuel Omasta, N.A.L.I. assistant executive secretary, and Roy H. Smith, also with Farmers Cooperative Association, Inc. Center: Mr. and Mrs. K. C. Ruedebusch, left, Mayville White Lime Works, Mayville, Wis., greet Senator Alexander Wiley of Wisconsin. Right: Anthony Di Santo, left, U. S. Department of Agriculture, P.M.A., Harrisburg, Penn., poses with R. H. Reish, Whiterock Quarries, Bellefonte, Penn.



U.S. GYPSUM'S 50 YEARS OF PROGRESS

Genoa, Ohio, lime and limestone plant of United States Gypsum Co.

World's biggest gypsum producer has spent $80,000,000 on postwar expansion and modernization

IT WAS IN 1902 that United States Gypsum Co. opened offices in Chicago to supply gypsum rock, land plaster, plaster of paris and wall plaster. Even those men who had the imagination, initiative and foresight to plan well into the future, in 1902, could not have been able to forecast that in 1952 United States Gypsum would be operating diversified production facilities at 46 separate plant sites, operating a fleet of ocean-going vessels, own 61,000 acres of mineral lands containing hundreds of millions of tons of gypsum, and more than 88,000 acres of timberland for pulp wood.

Today, there are so many uses for gypsum that it is virtually indispensable. The growth of United States Gypsum Co. closely parallels that of the gypsum industry in this country and, as the company celebrates its 50th anniversary this month, a review of its growth graphically shows how this mineral has stepped into such an important role.

Although records show that forms of gypsum plaster have been used for at least 5000 years, little was done to improve its use until about 50 years ago. Builders and artisans had known the calcining process of gypsum for centuries, but until some unknown American chemists in the latter part of the 19th century discovered how to better retard the setting time of gypsum it had limited use.

Early Products

The building board consisting of three layers of gypsum plaster sandwiched between four plies of wool felt paper, invented by Augustine Sackett in the middle 1890's, was one of the first products distributed by U. S. Gypsum and though this was an inferior product by modern standards, "Sackett" board was the forerunner of the gypsum wallboard construction that is used today.

Within a year after its formation, U. S. Gypsum introduced to its line a fireproof gypsum partition tile called "Pyrobar" gypsum partition tile, that offered advantages of fire protection, light weight, strength and economy. These precast gypsum block were the forerunner of a complete line of roof deck tile that are now widely used in modern commercial and industrial construction.

From the beginning, U. S. Gypsum fortified itself with men, equipment, plants and marketing services essential to steady progress, growth and prosperity. A research department was established to investigate the many potentialities of gypsum. Mines and quarries were placed under the supervision of experienced engineers, and geologists explored the country for new deposits. Plants were designed, built and maintained by specialists. The sales department, which had consisted of only three divisions manned by less than 50 people, was broadened so that it could function as a service organization to all users of U. S. Gypsum products. Economy and efficiency became apparent in all lines of company activity.

From 1902 until the conclusion of World War I, U. S. Gypsum introduced several new products and invented, developed and improved manufacturing processes. The consumption of gypsum in the United States had risen from 1,000,000 to 3,000,000 tons per year. From a net worth of $5,506,000 in 1902, the company prospered to $10,177,000 by 1918, and U. S. Gypsum passed from a period of organization into a new era of expansion.

In 1917, U. S. Gypsum introduced "Sheetrock" gypsum wallboard—the first gypsum wallboard, as we know it today—considered by many to be the most significant advance in the industry. This was an entirely new concept of interior wall and ceiling construction—large panels of gypsum between specially fabricated paper that were ready for any decoration.

In 1919 U. S. Gypsum completed its first modern gypsum board plant at Oakfield, N. Y. In rapid succession similar expansion took place at two other mills and in a short time U. S. Gypsum had established wallboard plants in 12 locations.

From 1930 to 1941, the company diversified its product line further. From a producer of gypsum and lime products only, it became a manufacturer of a wide line of other building materials. Ever-increasing and profitable markets were found for these materials. Today, production facilities are among the most modern in the industry.

New Plants

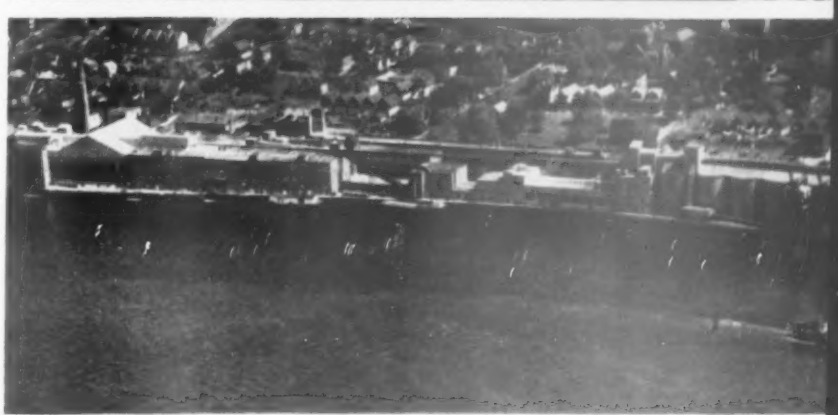
Since World War II, the company has spent $80,000,000 for new plants, new mineral properties, modernization and replacement of machinery and equipment, and employment of personnel. New plants have been erected at Norfolk, Va.; Plaster City, Calif.; Sigurd, Utah; and Empire, Nev., to meet growing market demands. The Plaster City plant has installed the largest gypsum board machine in the world. A new marine loading station was built at Hantsport, Nova Scotia, that is equipped to load vessels at a rate of 6000 t.p.h. Two new self-unloading ocean-going ships were also launched to speed and increase supply of Canadian rock to Eastern mills.

Plant expansion has been carried out at several locations since the last war. Gypsum wallboard gained its first widespread acceptance in the Southwest and several expansion programs have increased the Sweetwater, Texas, plant's output threefold over its original capacity to meet this demand. Its gypsum board capacity is now the largest in the world. At Fort Dodge, Iowa, large plant expansion practically doubled former capacity to meet demands of Midwestern markets. To supply requirements in eastern Canada, production capacity of the Hagersville, Ontario, plant was enlarged. Manufacturing facilities of the Jacksonville, Fla., plant were also expanded to serve the growing market in that area.

A new paper mill was built in Clark Township, N. J., to serve the needs of East Coast board plants. This operation is one of the most highly mechanized paper operations in the country. To streamline supply to the company's board plants in the West, a new paper mill was constructed at South Gate, Calif. The recent construction has placed U. S. Gypsum among the nation's top five producers of paper board.

Other new construction includes the insulating wool plant erected at Weston, Ontario, to serve the growing residential markets of eastern Canada.

The company, today, finds itself soundly positioned with an investment in plants, properties, machines and equipment of nearly $134,000,000 —all located to serve and supply major marketing areas. U. S. Gyp-



A few of the 46 separate plants operated by United States Gypsum: (top to bottom) Boston, Mass., gypsum products plant; Detroit, Mich., gypsum products plant; New Brighton, Long Island, N. Y., gypsum products plant; and East Chicago, Ind., gypsum products plant

50 Years of Gypsum Ideas

Major developments made through research facilities of United States Gypsum Co. during its 50-year history trace the progress of the entire industry.

1903—**Developed gypsum partition tile.** One of U. S. Gypsum's first important products—the forerunner of a complete line of fireproof partition and roof deck tiles.

1910—**Gypsum lath.** Introduced folded edge which strengthened board and nailing and later made possible solid gypsum core between two layers of paper.

1910—**Short span roof tile.** Opened gypsum roof-deck market.

1910—**Gypsum finishing plaster.** White lime-free finishing plaster.

1912—**"Bondcrete" plaster.** A special gypsum plaster for direct application to concrete.

1915—**Gypsum lath clip system.** Introduction of a resilient clip to attach gypsum lath to ceiling runners. Extended use of lath to commercial building field. Forerunner of later floating lath and plaster systems.

1917—**Gypsum wallboard.** Developed first folded edge 48-in. wallboard of gypsum, later became most widely used dry wall construction contributing greatly to residential building and remodeling.

1922—**Lightweight gypsum boards.** Invention of intermixing foam with gypsum core.

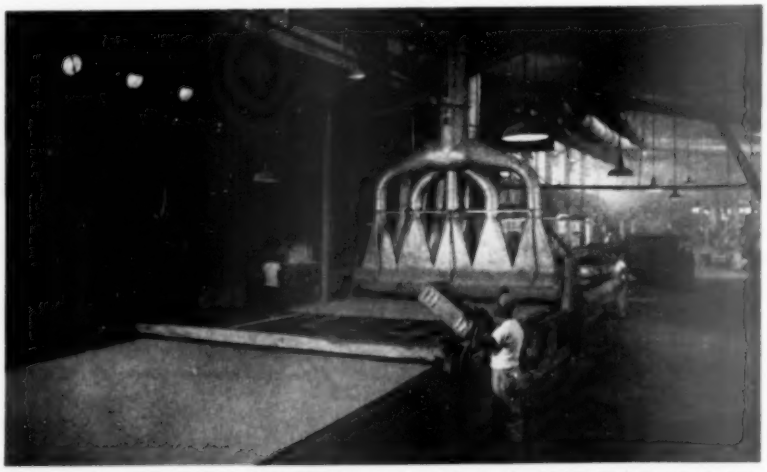
1924—**Texture paints.** Developed and introduced texture paints.

1926—**Acoustical plaster.** Introduced first gypsum sound control plaster. Forerunner of a full line of acoustical plasters.

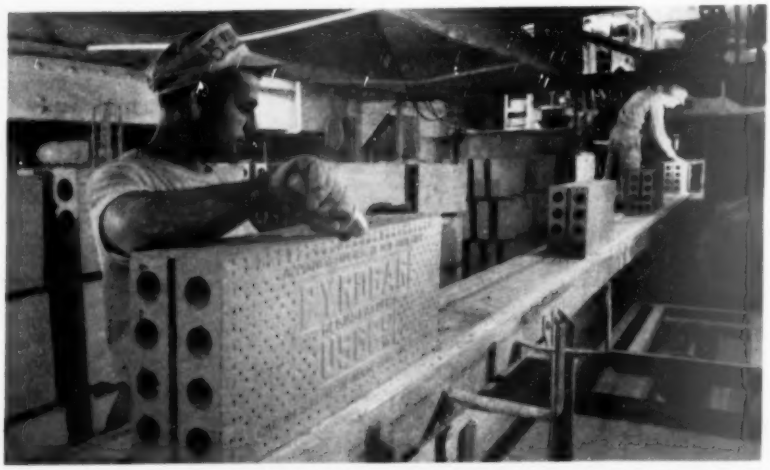
1926—**Recessed edge on wallboard.** First to depress wallboard edges to receive joint treatment, important to development of dry wall.

1927—**Gypsum sheathing.** First to develop gypsum sheathing with tongue-and-groove edges.

Gypsum products plant at Jacksonville, Fla., is ideally located for use of water transportation

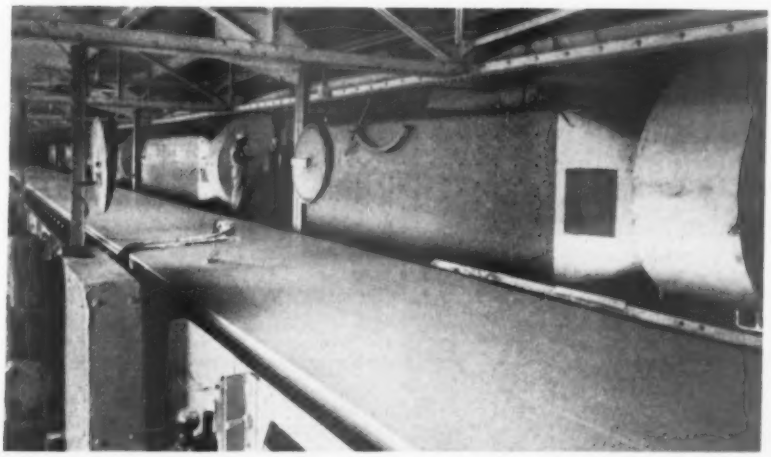


Insulation board leaving the multi-deck dryer at U. S. Gypsum's Greenville, Miss., plant. From here it goes to an automatic trimming saw to be cut into various dimensions



One of U. S. Gypsum's first important products was "Pyrobar" gypsum partition tile, here leaving the casting machine and traveling via conveyor belt through finishing and inspection to storage. In this machine, the plaster is mixed, the tile are cast, set takes place, and the tile are transferred in pairs to the conveyor

United States Gypsum's gypsum and gypsum products plant at Philadelphia, Penn.



Here a continuous ribbon of "Sheetrock" gypsum wallboard is being made at U. S. Gypsum's Staten Island, N. Y., plant. Following this operation, the wallboard will be kiln dried and then bundled for shipment

End of the processing line for "Weatherwood Twin Tile" decorative insulating tile board. After being accurately machined, it is stacked and packaged. The tile have been used a great deal for interior ceiling treatment in home and commercial building

50 Years of Gypsum Ideas

1929—**Incombustible mineral acoustic tile.** Marketed first lightweight incombustible acoustic tile.

1929—**Resilient sound resistant plastering system.** Pioneered the free floating resilient spring system of crackless sound resistant partitions and ceilings.

1920—**Dense gypsum plaster (industrial).** Developed specially processed gypsum plaster of great hardness.

1932—**Predecorated wood-grained gypsum wallboard.** "Sheetrock" was first laminated with attractive true colored wood veneer and simulated wood veneer surfaces.

1932—**Metalized gypsum board.** Introduced aluminum foil insulation applied to gypsum lath and wallboard surfaces.

1932—**Stabilized wall plaster.** Developed wall plaster with stabilized time set.

1933—**Perforated gypsum lath.** First produced a perforated gypsum lath to receive a one-hour fire rating when plastered with gypsum.

1934—**Hardboard (building and industrial).** Produced first two smooth sided hardboard manufactured from wood fiber.

1934—**Studless partition.** Developed a solid gypsum lath and plaster partition without studs.

1936—**Perforated tape for joint reinforcement.** Developed "Perf-A-Tape" particularly for gypsum wallboard treatment.

1939—**Glazed asbestos siding.** Introduced method of permanently glazing asbestos cement siding shingles so they do not require paint.

1939—**Lightweight wire stud.** Developed "Trussteel" stud of low cost for nonloadbearing partitions.

1939—**Resin emulsion paints.** Introduced an improvement in the water resistance of casein paints in the form of a resin emulsion product.

1940—**Pressure hydrated lime.** Developed method for successfully hydrating MgO in dolomitic lime.

50 Years of Gypsum Ideas

1940—**Mechanical system of erecting "Acoustone" tile.** Developed a metal spline and system of erection for acoustical tile.

1942—**Slotted fiber acoustical tile.** An improvement in fiber acoustical tile in the form of slotted surfaces for sound absorption ("Auditone") was put on the market.

1947—**"Brace-Tite" system of erecting gypsum lath.**

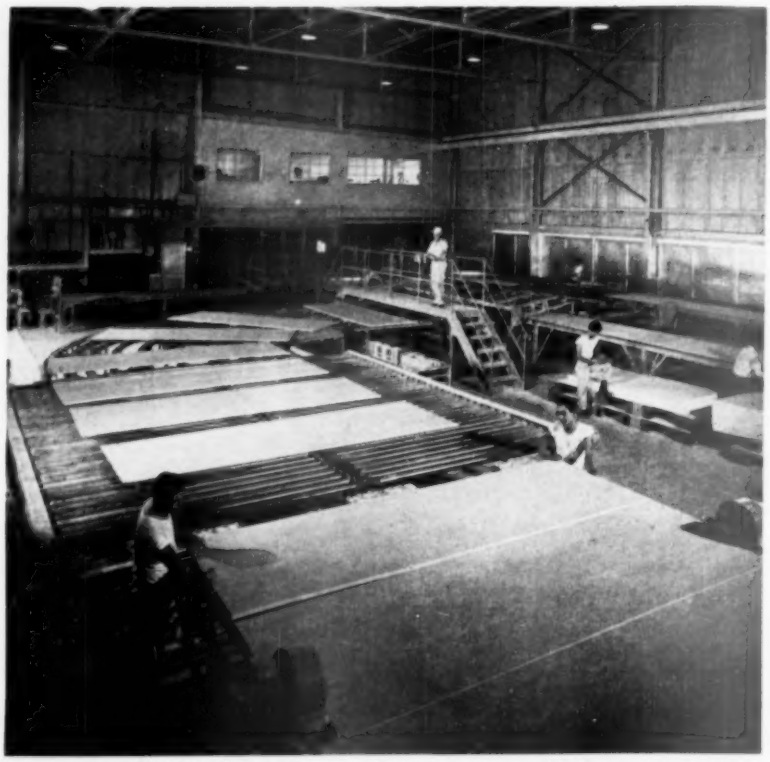
1948—**Water resistant gypsum sheathing board.** A highly water resistant gypsum sheathing board hav- an asphalted gypsum core.

1948—**Concrete finishing plaster.** A specially prepared finish ("Cover Coat") for concrete surfaces.

1949—**"Sheetrock Sealer."** An improved sealer for gypsum wallboard in liquid form.

1951—**Spark perforated "Perf-A-Tape" reinforcement.**

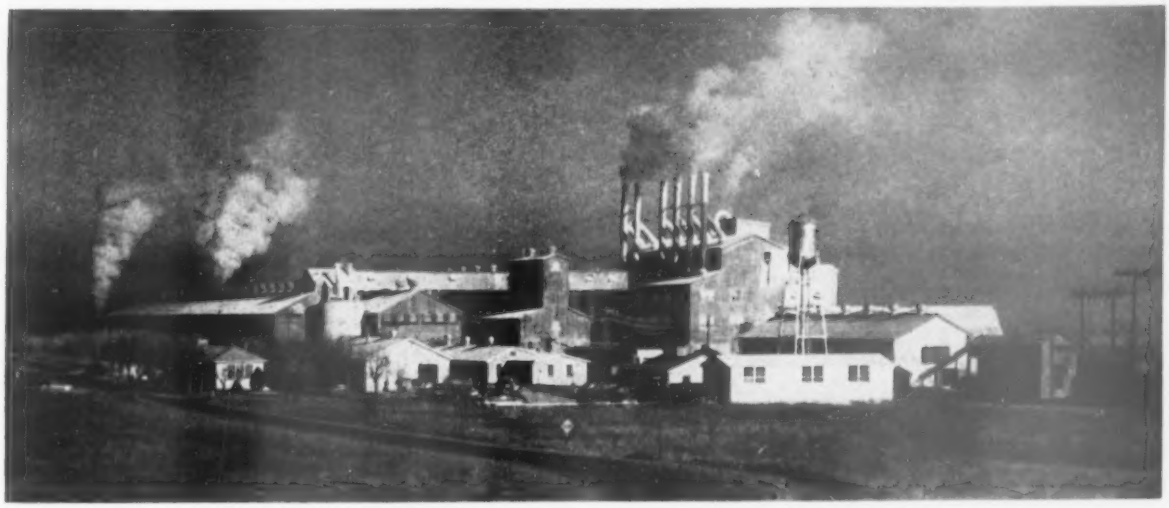
1951—**Plastic high calcium hydrated lime.**



Here gypsum wallboard, in double layers, has left the drying kilns and is being conveyed through the bundling operation, where twin boards will be automatically tape-bundled together. The bundles are then removed from the conveyor and stacked on warehouse trucks for movement to storage

Mining gypsum 600 ft. underground at U. S. Gypsum's mine at Plasterco, Va. Pneumatic hammers reduce large boulders to smaller sizes to be scooped mechanically into ore cars

Stern of one of the fleet of U. S. Gypsum's ocean-going ore vessels. At the far end of the dock the automatic unloading device is emptying the ship's cargo to the fast traveling belt conveyor at the left



Gypsum board capacity at the Sweetwater, Texas, plant is the largest in the United States

sum's present distribution system consists of 26,000 building supply dealers, and it has a sales staff of more than 1000 operating through a network of district offices located in principal cities of the United States and Canada.

In many ways gypsum has revolutionized the building industry. New gypsum plasters, gypsum, metal and insulating lath are enabling contractors to finish interior walls, partitions and ceilings in record time. As an example of its versatility, gypsum has even helped speed aircraft production, with three-dimensional models and patterns being made quickly with gypsum pattern cement. U. S. Gypsum's "Hydrocal" gypsum pattern cement also is playing an important part in certain kinds of pattern making in other industries.

In various forms, gypsum is used in toothpaste, window blinds, concrete cement, for grinding telescopic lenses, for making crayons. Even the beer industry uses it to aid in hardening the water. But most important, it has added almost a hundred new products for use in building structures. In a period of 50 years, gypsum has been developed to become one of America's indispensable minerals.

Calaveras Expansion

CALAVERAS CEMENT Co.'s fourth kiln being installed at the San Andreas, Calif., plant is expected to be ready for operation in the second quarter of 1952, as recently reported by company officials. Operation at that time is expected to prevent a repetition of the acute cement shortages experienced in northern California in the summers of 1950 and 1951. The new kiln is the key part of the company's $2,235,000 expansion program which is expected to increase production by 50 percent.

At Plaster City, Calif., raw gypsum is loaded to this modern diesel train from large overhead hoppers at the quarry (left) for the 26-mile trip across the desert to the mill where the material is processed

Vermiculite Plant

IN A RECENT ISSUE of *Via Port of New York* appeared an article pertaining to Vermiculite Industrial Corp.'s plant operations at Port Newark, N. J. Illustrations showed different stages of the processing and expanding of the vermiculite ore and the various forms in which it is produced and used.

The vermiculite ore for this plant is obtained from South Africa, imported through the Port of New York and stockpiled where it is then transferred to the adjacent plant by a special fork lift truck. The vermiculite ore is first graded to size desired, then transferred by belt to the furnace where in 30 seconds the thin crystals are separated at 2000 deg. F., expanding from ten to 20 times their original size. It is then screened according to end use.

Among some of the various uses of vermiculite is its use as an insulator, packing material, as an ingredient of refractory brick and linings, in sweat-preventing paint for metals, refractory cement, in soundproofing, in vermiculite-cement concrete for roof insulation and, also, as a plant food because of its high phosphate content, and as a soil aerator.

Partnership Change

KNOWLES ASSOCIATES, chemical, metallurgical and mechanical engineers, New York, N. Y., announce the resignation of R. C. Ried from the partnership. The remaining partners, C. L. Knowles, R. Chelminski and O. R. Kuster are continuing the business.

The new flotation plant of Del Monte Properties Co., Pacific Grove, Calif., is at the left; at the right is the older pilot plant and fine grinding and drying section

Flotation Process Applied to Silica

Del Monte Properties Co. uses attrition machine preliminary to froth flotation removal of impurities in production of silica

By WALTER B. LENHART

DEL MONTE PROPERTIES CO. is known throughout the world for its real estate holdings on the Monterey Peninsula of California, for its golf courses, hotels and the clubs that are situated on its property. Through an immense private area, known as the Del Monte Forest, run 100 miles of scenic roads. Curiously enough, there are comparatively few who realize that its most important business is the treatment of sand from the large dunes bordering the Pacific Ocean, to make it available for a great variety of uses, but principally for the manufacture of glass and for the ceramic industry.

The beach and dune sands processed at the company's plant are almost white in color and are practically devoid of any minus 100-mesh material, possibly due to Aeolian influences. The raw sand is about 50 percent quartz (SiO_2) and 50 percent high-alumina minerals; all of it will pass a 20-mesh screen.

Sand is reclaimed from the beach or dune deposits by an RD-7 Caterpillar and dozer with a ¾-cu. yd. clamshell crane loading to a field hopper serving a conveyor system which leads to a surge pile adjacent to the plant. Reclaiming from the surge pile is done by belt conveyor.

Approximately 0.2 percent, or 4 lb. per ton, of the raw sand are so-called "heavies." The heavies are all dark to black minerals and include ilmenite, garnets and monazite, with smaller amounts of zircon. The removal of these heavies, as well as the separation of the silica or quartz fraction from the high-alumina minerals, is the primary purpose of the new flotation plant. This enables the operator to manufacture a silica sand of exceptional grade, and a low cost high-alumina sand that can compete on a quality basis with any produced in the United States.

For the past several years the company has been operating a small pilot plant and, in conjunction with American Cyanamid Co.'s flotation staff, has worked out a method of removing the iron-bearing heavies from the sand, in addition to producing high-grade quartz sand and high-alumina materials.

Cleaning by Attrition

Much of the flotation technique is built around the use of a new type of machine, whereby the surfaces of the particles receive a thorough cleaning and scouring. This "attrition machine" is new to the industry and was first developed by the Del Monte com-

Much of the flotation technique is built around the use of a new type of machine, the "attrition" machine. Left: Rear view of machine. Center: Front view of the machine. Right: Looking down on the three attrition machines; 18 motors are used on the three assemblies

pany and Owens-Illinois Co. Later, rights to manufacture and sell the unit were assigned to Western Machinery Co., which has made certain patented improvements.

In any flotation process one of the fundamental considerations must be a physical separation of the mineral particles. In the past much of this separation has hinged on the partial destruction, by fine grinding, of the mineral components. Even if the small particles were coated with a film of slime this coating had to be removed, either by fine grinding or by washing processes that for the most part were inadequate. On the other hand, fine grinding might split a film-coated particle in half, thereby exposing a single clean face. In the subsequent flotation such a particle might, or might not, float properly, and perhaps would be led into tailings.

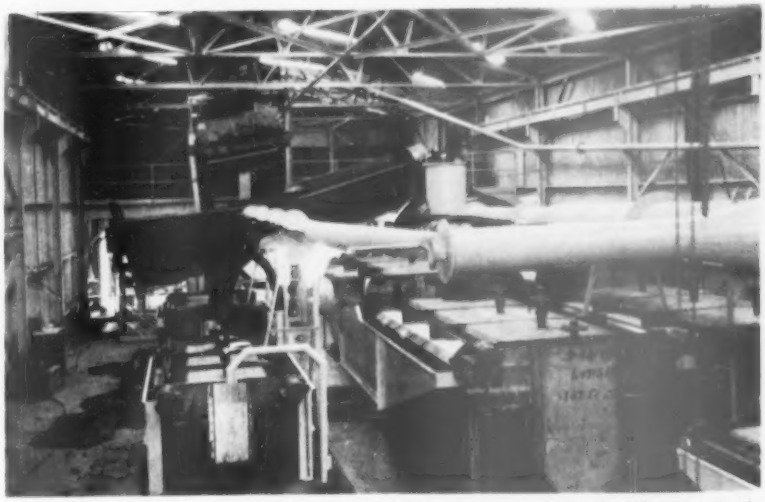
The attrition machine is designed to scour and scrub the individual grain particles. Undoubtedly it will have an extensive use in processing commercial sands of all types, as well as in metallurgical work, with emphasis on the preliminary scouring of a mineral particle in preparation for later conditioning and flotation.

At the Del Monte plant there are three banks of attrition machines, which operate in parallel. Each bank consists of six attrition units, each of these in series with its neighbor. The attrition unit is comprised of a vertical, rubber-covered steel spindle to which 18 rubber-covered steel paddle arms can be bolted. Each spindle is driven by an individual motor with speed of rotation governed somewhat by operating conditions.

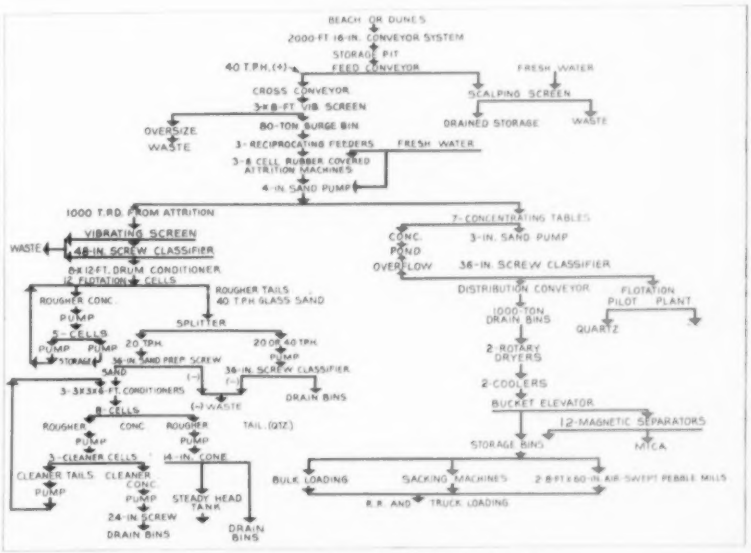
At this plant the spindles operate at 180 r.p.m. and in each bank, starting at the feed end, the U. S. motors used are 15-, 15-, 10-, 10-, 10- and 10-hp. units, respectively. It will be noted that the horsepower requirement at the feed end is greater than at the discharge end. This seems to be a general condition and the reason will become apparent later in the article.

A noticeable feature of the attrition machine is that the pulp in the units is in the 75- to 80-percent solids range, and in operation it resembles a thick mush. A spindle operates in an octagonal cell and the flare or slope of a set of three agitator blades on each spindle is such that a reversal of pulp flow is experienced. As the pulp enters the top of the No. 1 unit, the blades throw the material so that the pulp might be considered as paralleling the flow in the suction of a rotating series of blades. Immediately below the slope the blades transpose the movement to pressure and finally, at the bottom, flow characteristics are again reversed.

The flow at the Del Monte plant is such that the sand enters the top of the first cell and by means of suitable baffles enters the next cell by a rever-

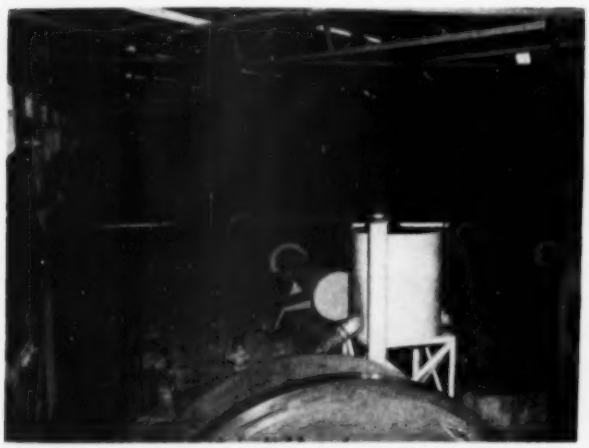


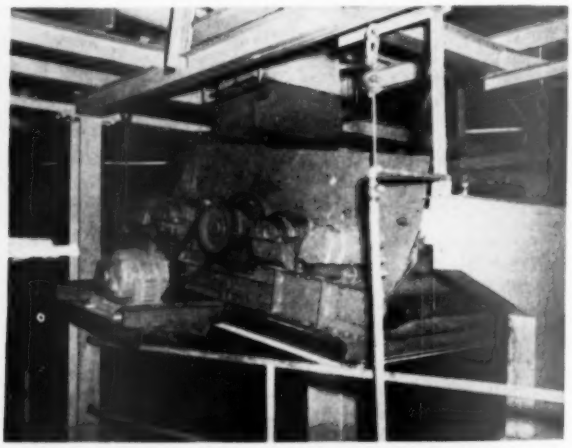
The flotation roughers are in the right foreground and the cleaners at the left. These are in the heavies-silica float circuit



Flow diagram of the Del Monte sand plant

Most of the pumps are in the basement, of which six are shown, with steel feed sumps





Left: Looking down at the flotation machines in the heavies-silica circuit. Right: A vibrating screen removes the oversize material and wastes it, after which the pulp is dewatered ahead of the conditioner

sal of the general direction of flow. With this type of stirring in the octagonal container there is a continuous rubbing action of particle against particle, not a general circular motion of the mass. The thick pulp also helps insure intimate contact between each grain.

In the first cell the sand pulp appears to be grainy and stiff, but as the surface clay is removed the character of the pulp gradually changes and the clay appears to act as a lubricant. This possibly accounts for the lessening of horsepower requirements as the sand moves through the units.

At the Del Monte company the sand stays in the machine a total of 18 min. Each cell has a volume content of 8½ cu. ft. The drive is similar to that used on the Fagergren flotation machine, with each spindle connected directly to the outboard end of its drive motor. The three parallel banks handle 1000 t.p.d. and the machines have handled up to 50,000 tons before replacement of wearing parts became necessary.

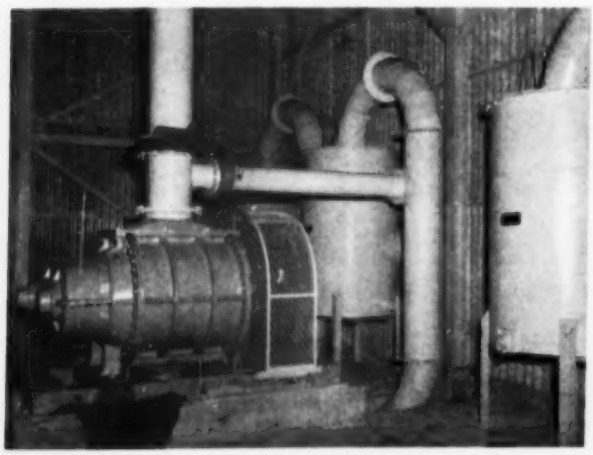
After six consecutive scrubbings, the high-solids pulp flowing from the machines must be diluted to allow pumping of the material. This is done by adding water in the line to the pump. During the early pilot plant operation desliming was tried after treatment in two units, after which the sand was sent to two more attrition units and again deslimed. This plan was based on the desire to remove the slime coatings almost as quickly as liberated. However, the present method, which employs six units in series, was finally adopted as the most suitable.

After passing the attrition machines, the sand is pumped by a 4-in. Wemco sand pump to a small Tyler vibrating screen that carries a 20-mesh deck and is designed essentially as a trash screen. The throughs drop into a 48-in. Wemco dewatering spiral and the overflow (containing much of the slimes and surface contaminants liberated in the attrition machine) is wasted.

The sand fraction from the spiral goes to a Standard Steel horizontal-type conditioner, deemed almost a necessity because of the lack of fines and slimes in the pulp, which results in a fast settling rate. If a conventional, vertical, paddle-type conditioner were used, the fast settling of the pulp might cause stalling. The horizontal conditioner is fed at one end and discharges at the other, operating at about 10 r.p.m. It is driven through a U. S. gear motor reduction unit. There are lifters inside the barrel which hold a considerable volume of pulp. In the later flotation of the high-alumina minerals and silica, conventional agitator-type conditioners are used.

Flotation

In the flotation at the Del Monte sand plant the iron content of the feed to the attrition machines is in the 0.14-0.15 percent range. A considerable portion of the plant's output is a natural half-and-half blend of silica sand and high-alumina sand (minus the heavies), since this material seems to be highly acceptable to the glass industry within the shipping area. When this blend is prepared the



Left: Partial view of air filters (right) on the suction side of 18- x 30-in. rotary blowers, one of which is shown. Right: The horizontal-type conditioner is used because of the lack of fines in the feed which would settle too rapidly in the conventional type of conditioner

iron content is slightly higher than the iron content of the silica sand produced when the high-alumina sand and silica are separated by flotation, for apparently the iron follows the high-alumina material more than it does the silica. In the separation the silica product has an iron content in the 0.02-0.05 percent range.

It is necessary to point out that in the first flotation treatment about 2½ percent of the total input is floated and wasted, making up the heavies. If this same type of sand is floated, without first going through the attrition machines, waste is in the 40 percent range.

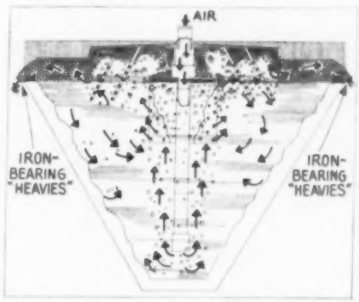
In the flotation section there are two circuits. The circuit designed to remove the heavies consists of 12 Steffensen No. 60 roughers and five No. 20 cleaners. In the high-alumina sand-silica separation section there are eight roughers and three cleaners. The latter are No. 20 Steffensen flotation machines.

Tailings, middlings, concentrates, etc., in the flotation flow are handled by a battery of Wemco sand pumps driven by U. S. motors. All of these pumps are in the subbasement under the float cells.

The Steffensen flotation machine was developed near Lebanon, Penn., by the Bethlehem Steel Co., in connection with flotation of iron ore. It has no mechanical moving parts and is designed to handle coarse or heavy products. Low-pressure air is used to supply the necessary agitation and is a source of air bubbles for the froth flotation. The unit is a cone-shaped machine with low-pressure air entering through a single pipe near the bottom of the cone. As the air rises near the surface bubbles encounter the "Air Miser," a series of downward deflecting baffles that re-use the air with a net high efficiency. The float machines are equipped with wipers driven by ½-hp. Janette motors.

The flotation machine parts exposed to the pulp are of stainless steel because some sulfuric and hydrofluoric acids are used in the reagent set-up and a pH of about 2.5 is maintained. The 800 Series of American Cyanamid's reagents plays an important part in the flotation of the heavies.

Air is supplied by three 18- x 30-in. Sutorbilt rotary blowers, each driven by a 125-hp. U. S. Auto-Start ball bearing motor. A Model 42-WO3 Cycoil air filter is installed on the suction side of the blower. Each blower has a capacity of 3500 c.f.m., and delivers at 5 p.s.i. pressure. Large diameter steel ducts lead the air to each battery of cells with adequate slide-type gates inserted at strategic points to distribute the air as needed. Pressure gauges are installed at several places in the network of air ducts so that operators can better control the delivery of air to each bank of cells. In the Steffensen cell the size designation (No. 60, No. 20, etc.) indicates its



General principal of the air-actuated flotation cell as used in silica-heavies separation. The finished sand outlet is not indicated here

cubic capacity in feet, so approximately 10 c.f.m. of air per cu. ft. of cell capacity is available at the blowers.

The flotation plant is one section of the silica-high-alumina mineral processing and is set up in such a way that, if desired, it can be by-passed in part or completely.

The older part of the plant features the use of seven Overstrom bumper-type concentrating tables and the quartz-high-alumina sand pilot test flotation plant. Two 5- x 16-ft. Standard Steel rotary dryers are used and each dryer has a cooler of about the same size. Processed sand can be treated on a battery of 12 Dings induction-type magnetic separators. Fine grinding is accomplished by two 8-ft. x 60-in. Hardinge air-swept pebble mills, and a 10-ft. x 96-in. mill of the same manufacture is being installed. These mills are all equipped with Hardinge collectors.

The flotation plant is of steel and concrete construction with adequate room for aisles and walkways. A 2-ton capacity crane, manufactured by Manning, Maxwell and Moore, Inc., spans the room. The plant was designed by the Western-Knapp Engineering Co., an affiliate of Western Machinery Co., and is served by the Southern Pacific railroad.

Personnel

S. F. B. Morse is president and chairman of the board of Del Monte Properties Co.; William E. Messner is manager of the sand plant; Charles Houseman is plant superintendent; and Henry Benech is analyst.

S. F. B. Morse, (left) president and chairman of the board, Del Monte Properties Co., and William E. Messner, sand plant manager

O.P.S. Supplementary Regulation

O.P.S. has issued Supplementary Regulation 18 (under Ceiling Price Regulation 22) which makes available to certain manufacturers whose last fiscal year net sales did not exceed $1,000,000, an optional method for obtaining the major benefits of the "Capehart Amendment" (Section 402 (d) (4) of the Defense Production Act of 1950, as amended).

This regulation is intended primarily as a relief for companies which are not small enough (sales of less than $250,000) to avoid CPR-22 entirely, but not big enough to keep the records needed for the regular Capehart (SR-17) computations.

Under this supplementary regulation, adjustments for both labor and material costs may be made up to July 26, 1951. This represents a more liberal allowance in most cases than that provided by the cutoff dates of the original CPR-22. Furthermore, these adjustments may be made without the necessity of making the accompanying overhead adjustments required by SR-17.

SR-18 permits use of the base period price as the ceiling price, or to make only the materials cost adjustment. However, if a labor cost adjustment is made, then the materials cost adjustment must also be made. There are also new provisions dealing with the determination of ceiling prices for commodities introduced after June 24, 1950, commodities dealt in during the second half of 1949, but not dealt in during either of the 1950 base periods, and with reports.

There are two basic limitations on the option to use this supplementary regulation:

1. It is limited to manufacturers whose net sales for their last complete fiscal year, ended not later than July 31, 1951, did not exceed $1,000,000.

2. A manufacturer's net sales during the first half of 1951 may not be more than 15 percent above his net sales for the same period of the preceding year.

In addition, any manufacturer who uses this supplementary regulation must use it for all of his commodities covered by CPR-22. To obtain ceiling prices under SR-18, a report must be filed on OPS Public Form No. 105 which may be obtained from any regional or district O.P.S. office. The report must be filed by registered mail with the O.P.S. national office.

Changes Address

The National Agricultural Limestone Institute has announced the removal of its offices from 1424 K St., N. W., Washington, D. C., to 619 F St., N. W. The new address became effective November 30, 1951.

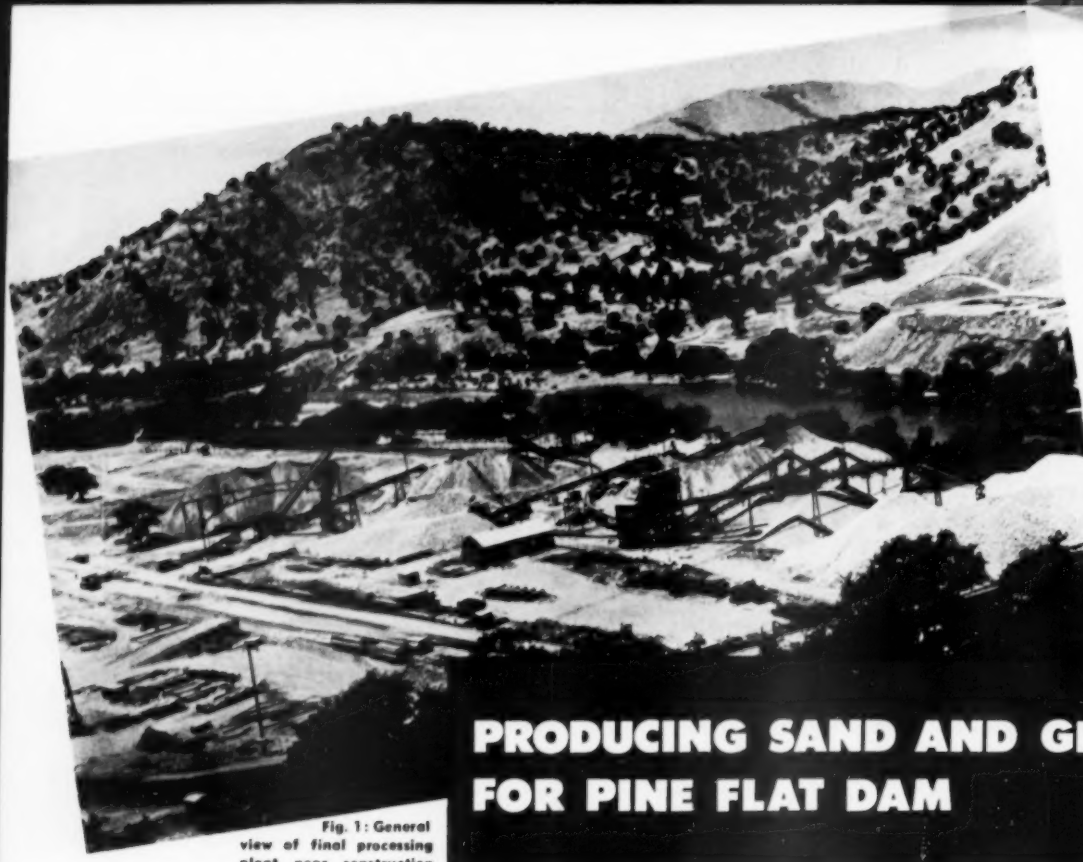


Fig. 1: General view of final processing plant near construction site

PRODUCING SAND AND GRAVEL FOR PINE FLAT DAM

Hydraulic sand sizers and removal of foreign material from aggregates are highlights of flexible plant. Mass concrete is notable for use of 2-bag mix

By WALTER B. LENHART

PINE FLAT DAM, now under construction by the Corps of Engineers, U. S. Army, is the second highest dam in California and the eighth highest in the world. It is of concrete construction and is a gravity-type dam spanning the Kings river about 30 miles east of Fresno, Calif.

Essentially it is a flood control project with provision for power. The 1,000,000 acre-ft. of reservoir storage is required for flood control. However, climatic conditions also permit the full utilization of this space for conservation storage at the end of the flood season. As a result, the reservoir can be operated for the benefit of irrigation, development of hydroelectric power, and other benefits that accrue from stretching a heavy seasonal water supply over a long, dry summer.

Fig. 2: Batching plant for Pine Flat dam; the dam is in the background. Coarse aggregates are cooled by a cold air system, with ice chips being added to the mix if weather conditions require. Cement is cooled in a battery of coolers

ROCK PRODUCTS has always maintained that publication of data related to a new operation should be delayed until difficulties have been eliminated and necessary changes made. The writer called at Pine Flat during preliminary operations and returned a year later to get the final picture presented here.

The dam and aggregate production facilities are of considerable interest to aggregate producers because, first, the interior concrete uses a two-bag mix. It is believed that this project is the first to ever successfully use this low a cement factor. Second, an efficient and practical method has evolved for removal of roots, wood chips and similar foreign matter in the aggregates.

Third, the sand production method has an unusually high degree of flexibility revolving about the use of two hydraulic-type sand sizers which split approximately 30 percent of the raw sand feed into eight component grain size groups (not clean sieve size separation). Although original plans called for blending of the sand from the sizers, no blending has ever been necessary. The sand grading is kept in balance by wasting any sand grain sizes found to be in excess in the finished sand. Sand grain sizes found by analysis to be in excess in the finished sand are sent to waste from the sizers, the balance of the sizer products are returned to the main sand feed going to rake classifiers. The original plan of stockpiling certain splits from the sizers and using them for blending with the finished sand has never needed to be used.

Fourth, the use of industrial rail-

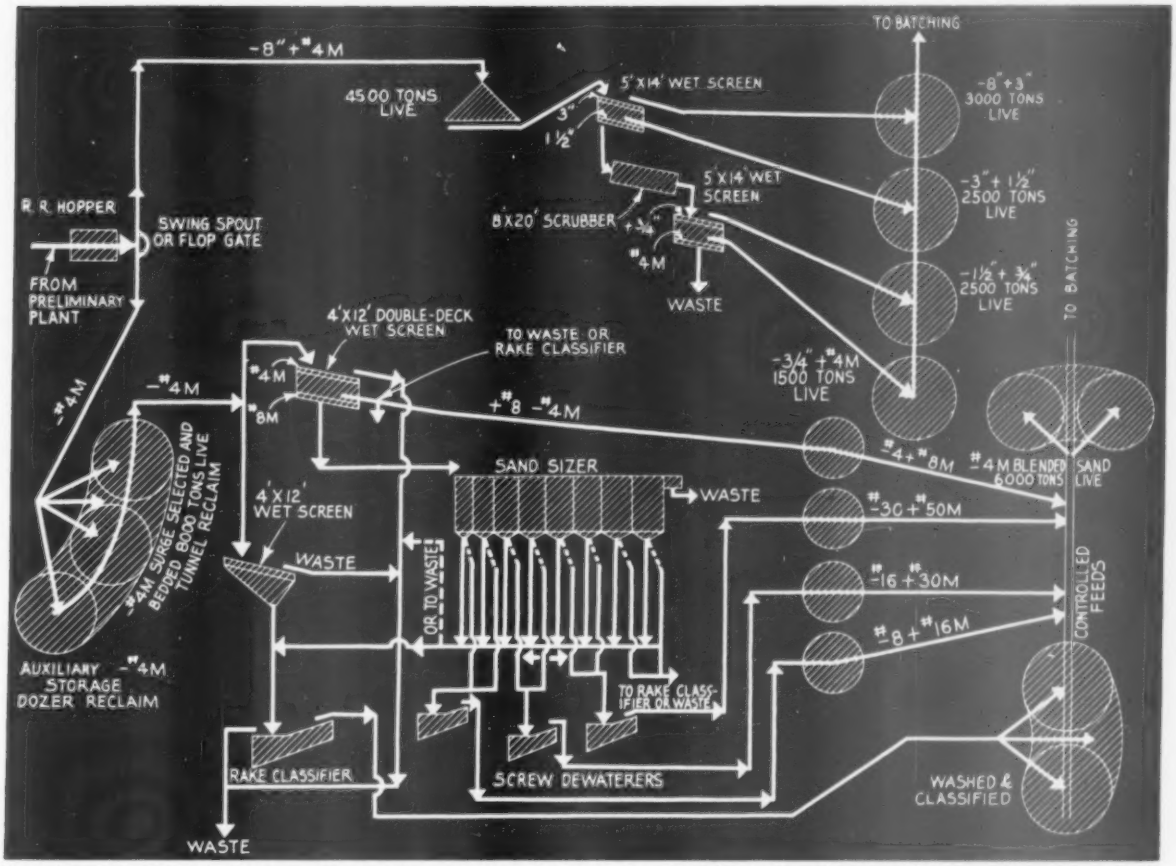


Fig. 3: General layout of the final processing plant for aggregates at Pine Flat dam. Although the set-up shown here shows the original plan of stockpiling certain splits from the sand sizers and using them for blending, it has not been necessary to use this system. Instead, the sand grading is kept in balance by wasting any sand grain sizes found to be in excess in the finished sand

road equipment to move the aggregates a distance of six miles; and fifth, it is one of the few dams being built by the Corps of Engineers that does not include electric power development as a preliminary part of the program. These conditions, along with several others, make the Pine Flat operation worthy of considerable study by members of the industry.

The removal of roots and other wood fragments from the aggregate stems from the use of a river bar or island deposit about six miles down the Kings river as the source of the aggregates. At that point a 120-B Bucyrus-Erie shovel, using a 6-cu. yd. Esco bucket, loads to 30-cu. yd., side-dump, industrial rail cars which haul the material to Plant No. 1. This is a preliminary screening and washing operation where two products are made, the coarse aggregate and a sand. The former is plus ¼ in. minus 8 in. and the latter is a minus ¼-in. fine aggregate.

The coarse aggregate and sand are hauled the six miles separately to Plant No. 2, which is approximately 4000 ft. from the dam construction site. At Plant No. 2 a final concrete sand is made in addition to four sizes of coarse aggregates. The latter are stockpiled, but the presence of so many roots and fragments necessitates the incorporation of a root removing process. The method involves the use of a fan mounted under each belt conveyor serving its storage pile (Fig. 4). A rectangular steel duct carries the air from the fan to a point near the head of the rock ladders, and a separate chute collects the lighter debris and by-passes it out of the way.

The blowers installed atop the stone ladders eliminate a portion of the roots by blowing a stream of air through the gravel stream as it falls from the head pulleys, but during periods of excessive roots, and other wood debris, it has always been necessary to augment this method by hand-picking on the conveyor belt at the main separation plant and also on the main reclaim belt from the stockpiles to the batch plant.

The recovery of sand at Pine Flat is our primary interest because the processing of the coarse aggregate involves no unusual screening problems nor any major crushing operations. A small Cedarapids jaw crusher is available for incidental crushing should it be required, but essentially the aggregate is a 100 percent gravel product and, as previously pointed out, a share of the plus 8-in. material is wasted.

The material is scalped on an 8-in. screen, producing a 7-in. maximum size coarse aggregate. In addition, 70 percent of all oversized material is being crushed to produce 3- to 6-in., 1½- to 3-in., and ¾- to 1½-in. sizes which are added to the feed at the plant at the railroad track hopper.

Preliminary Screening and Washing

The preliminary screening and washing plant at Pine Flat presents an interesting evolution in plant design. The plant has undergone somewhat of a continuous modification and several features planned and installed were never actually used. The salient points regarding the revamping of the plant are namely:

(1) First attempt to separate the fine from the coarse aggregate in a moist, pit-run condition by means of rod-deck screens was unsuccessful due to the progressive wedging action of the gravel particles between the rods, forcing them apart and dislodging them.

(2) The interim period of opera-

Fig. 4: Fans blow roots, wood chips, and other lighter debris from the sized aggregate as the material cascades down the stone ladders

tion during which the rod-deck screens were set at ¾ in. and the fine and coarse aggregate separation made at this setting. This proved uneconomical due to the fact that the ¾-in. gravel had to be scalped from the sand at the sand plant, necessitating additional handling of the ¾-in. gravel and automatically reducing the efficiency of the sand plant.

(3) The present phase of operation after changing the plant over to a wet-screening operation, which is illustrated in Fig. 11.

At present, at Plant No. 1, the pit-run is given a preliminary screening (Fig. 5 and 8). The minus ¼-in. material from the screens is split to three Wemco sand machines, one 60-in. and two 48-in. units. The sand from these is bulked into a ground storage pile from which the material is later reclaimed by belts and shipped over the six-mile haul to Plant No. 2. The sand machines enable the operators to eliminate almost immediately any unwanted slimes or fines and to give the sand a preliminary wash. When desired, minus ¼-in. wastage can be carried out here. All rejects are flumed to worked out portions of the pit since stream pollution is not permitted in California. Excavation work proceeds at the rate required, and intraplant transportation is at the rate of 9100 t.p.d. with hours worked as required.

Equipment used at Plant No. 1, which has not been mentioned above, includes: two 5- x 12-ft., double-deck, wet F-600 Tyler scalping screens; three 44-ton General Electric diesel locomotives, powered with Caterpillar D-17000 diesels; Magor Car Corp., Western and Koeppel side-dump, standard gauge rock cars; Conveyco feeders under track hopper; and three, 4- x 8-ft. Symons double-deck, wet, vibrating screens.

Before actual construction of the dam, considerable study was devoted to what method of transportation should be used to bring the several million cu. yd. of aggregate from Avacado, six miles downstream from the dam site. A long belt conveyor installation and truck hauling were given serious consideration but finally standard gauge railroad haulage was decided upon as the most suitable. The area immediately below the dam site is wide and relatively flat, making it ideal for rail switching facilities and haulage.

Unloading facilities at Plant No. 2 can proceed at the rate of 600 t.p.h. for the coarse aggregate and at a somewhat slower rate for the sand. The diesels are 100-ton units. Under the track hopper is a 36- x 60-in. Conveyco plate feeder serving the belt unloading system. A flop-gate can divert the coarse aggregate to its 4500-ton live storage pile, or send the minus ¼-in. sand to one of two live piles holding 8000 tons. These two piles are formed by a radial stacker and attempts are made to bed the sand as received so, when withdrawn to the reclaiming belt below the pile, a blend is obtained. Additional blending and reclaiming are possible by the use of a Caterpillar RD-8 tractor. At one time feeders were installed at the several reclaiming points in the processing set-up but were dispensed with since they evidently did not have suitable capacity. At the time of inspection reclaiming was accomplished by conventional gates.

The processing of the coarse fraction (Fig. 9) is quite simple and involves two, wet, double-deck, 5- x 14-ft., Allis-Chalmers Ripl-Flo screens, which prepare the two larger sizes of aggregate; plus 3 in. minus 6 in. and plus 1½ in. minus 3 in. The fines from

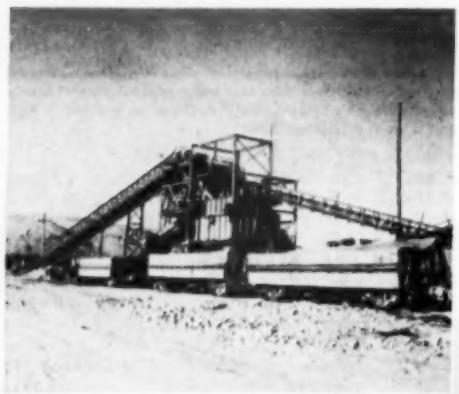


Fig. 5: All plus 6-in. material is wasted at the preliminary screening and washing plant (Plant No. 1). The 30-cu. yd. cars in the foreground are here receiving the waste material for haulage to the waste disposal area

Fig. 6: Unloading aggregates at the track hopper serving the main processing plant near the dam site

Fig. 7: Train load of pit-run material headed for the preliminary washing plant; the operation has three diesel locomotives

Fig. 8: Plant No. 1—General view of plant at pit for preliminary processing of the gravel. The minus ¼-in. material from the screens is split to three sand machines; one is at the lower left. Sand from these is bulked into ground storage and later reclaimed by belts for shipment to Plant No. 2

Fig. 9: Plant No. 2—Processing of the coarse fraction is relatively simple. The two coarser sizes are not put through the rotary scrubber (center of picture), only the minus 1½-in. material. The four sizes of gravel are ground stored and reclaimed by belt and then delivered to batching plant by belt

Fig. 10: Plant No. 2—Sand processing flexibility revolves about the use of two hydraulic-type sand sizers. The two sizers are under the vibrating screens at the top of the structure; most of the discharge from the sizers is dewatered by a rake dewatering unit (lower left)

the lower deck are next scrubbed in an 8- x 20-ft. rotary scrubber, manufactured by Willamette Iron & Steel Co., and are screened on two 4- x 12-ft. Allis-Chalmers Lo-Head, wet screens. These screens produce the plus ¾-in. minus 3 in. and the plus No. 4 minus ¾ in. The four sizes of gravel are ground stored in piles that range from 3000- to 1500-live tons (Fig. 3). A reclaiming belt operates under the piles and, via a 4000-ft. belt conveyor system, the finished aggregates are delivered to the batching plant. In a structure alongside the batching plant are four additional screens for the final screening and rinsing. These are also Allis-Chalmers, two 5- x 16-ft. Ripl-Flo, and two 4- x 14-ft. Lo-Heads.

Final Sand Recovery

The sand plant at the No. 1 plant went through a reconstruction and alteration period and the first plant was based on the treatment of a minus ¾-in. product which included raw sand. However, with the installation of the Wemco sand machines at Plant No. 1 and the preparation there of a minus ¼-in. material from which all sand later was to be made, the set-up for sand at Plant No. 2 was materially altered.

It will be noted in Fig. 3 that there are five sand piles, the "washed and classified pile" being by far the largest and the only one used. The other sizes are not stockpiled as originally planned and shown in the drawing. However, the system was originally planned as follows: Four smaller piles are shown, namely: plus 8 mesh minus 4; plus 16 mesh minus 8, plus 30 mesh minus 16; plus 60 mesh minus 30. These four sizes along with the washed and classified material in the larger pile can be blended on a belt and restacked by a large radial stacker into a 6000-ton live sand pile. As it is, no blending is necessary as already explained. Three-day drainage throughout the system is the minimum requirement.

The sand received from the stockpile at Plant No. 2 is split between two Allis-Chalmers Lo-Head screens (Fig. 10). One screen is double-deck and has 0.202 and 0.120 in. square openings; the second screen is single-deck and has two different size screen cloths, one piece of 0.200 mesh and two pieces of 0.120 mesh. Both are 4- x 12-ft. units and operate wet. Plus 4-mesh material is wasted. Products on the lower deck of the two-deck screen are sent to their storage pile and are the plus 8- minus 4-mesh sizes. All undersize from this screen is

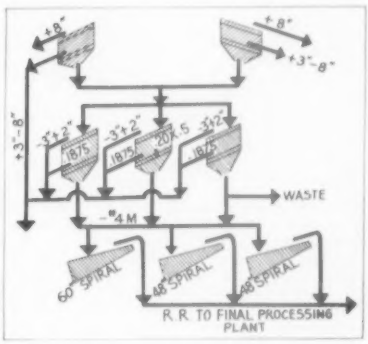


Fig. 11: Primary processing plant is a wet-screening operation

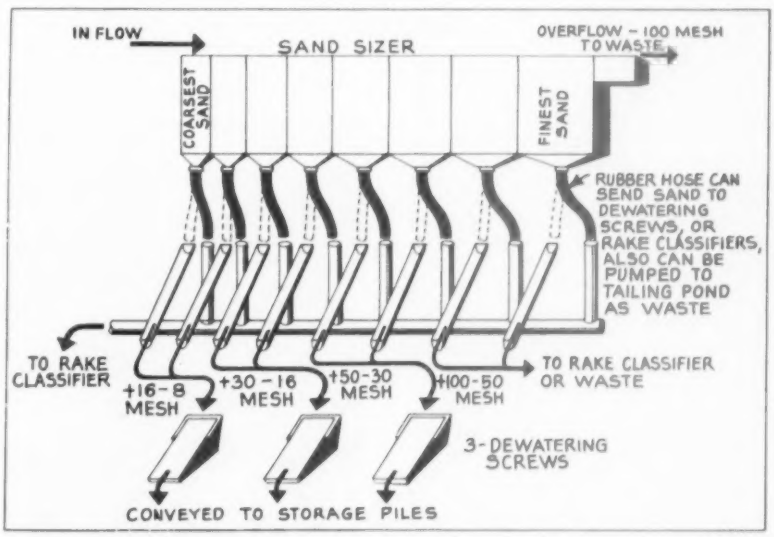

IN FLOW
SAND SIZER
OVERFLOW – 100 MESH TO WASTE
COARSEST SAND
FINEST SAND
RUBBER HOSE CAN SEND SAND TO DEWATERING SCREWS, OR RAKE CLASSIFIERS, ALSO CAN BE PUMPED TO TAILING POND AS WASTE
TO RAKE CLASSIFIER
+16-8 MESH
+30-16 MESH
+50-30 MESH
+100-50 MESH
TO RAKE CLASSIFIER OR WASTE
3-DEWATERING SCREWS
CONVEYED TO STORAGE PILES

Fig. 12: Sketch showing how the hydraulic sand sizer operates. The sizer splits approximately 30 percent of the raw sand into eight component grain size groups, not clean sieve size separation. Products can be sent to the rake classifier or waste. The purpose of the dewatering screws was to dewater the splits from the sizer, but since it has not been necessary to stockpile these splits for blending as originally planned, the waste splits are sent directly to waste disposal when not going through the rake classifier

Fig. 13: Cement silos, located up the hill from the batching plant, are filled by bulk cement truck haulage units that haul from the cement plant. In the truck unloading hopper, the cement is partially cooled before elevation to storage tanks by cooled water flowing through a series of pipe

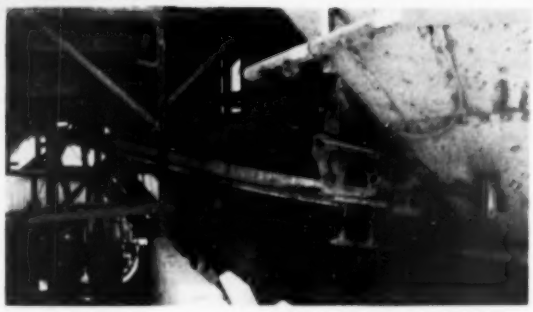


Fig. 14: Low pressure air-activated gravity conveyors deliver the cement from the silos to the bin over the batchers

split to two, eight-spigot, Dorrco sand sizers, operating in parallel. The Dorrco sand sizer is a hindered-settling sand recovery unit. The pulp flows in one end, through eight compartments of decreasing size, and gradation by size is accomplished with the coarser sands in the first compartment. The device is automatically unloaded but the high water content of the products usually necessitates dewatering. At Pine Flat most of the spigot discharge is dewatered by a duplex, 32-ft. Dorrco rake dewatering unit. The remainder of the spigot discharge can be diverted to sand screws.

Some classifying is possible with the rake dewatering unit by raising or lowering the adjustable weirs of the reservoir section.

The sand from the first two spigots of the sand sizer (Fig. 12) is essentially a plus 16- minus 8-mesh product; from the next two plus 30- minus 16-mesh size. In decreasing order the sizes become plus 50- minus 30-mesh, with plus 100- minus 50-mesh from the last spigot. The overflow is mostly minus 100-mesh and is wasted. On the discharge nipples of each compartment of the sand sizers rubber hose has been installed and these, in combination with a series of launders, make it possible to easily divert the spigot products to three directions: (1) part or all of the material can be sent to a rake dewatering unit; (2) any desired fraction can be sent to one of three Stephens-Adamson screws; or (3) the material can be wasted. The purpose of the dewaterers was to dewater the splits from the sand sizers, but as has been previously stated, these waste splits are not stocked for blending as originally intended, but are sent directly to waste along the river bank.

That sand going to the single-deck screen has the plus 4-mesh fraction wasted. The minus material goes direct to the Dorrco rake dewatering machine. Plant capacity is normally 250 t.p.h. with approximately 20 percent waste.

The sand from the rake dewaterer falls to a reversible belt and before hitting the belt contacts a baffle that splits the load. The finished sand can go either to the pile previously referred to as the washed and classified pile, or to the blending belt ahead of the blended sand storage pile.

Water for washing and screening at Plant No. 2 is secured from three

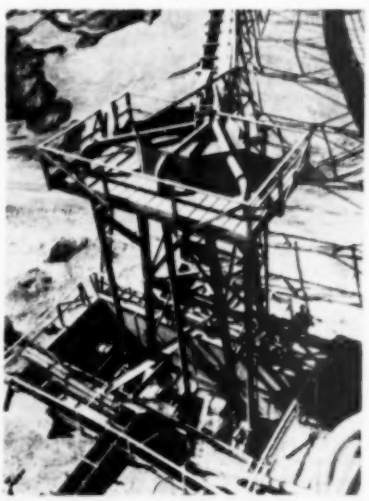


Fig. 15: Sand pumps in the pit are for final disposal of dirty wash water at Plant No. 2

Layne & Bowler deep-well pumps mounted in the Kings river. These have a capacity of 1750 g.p.m. each.

Portland cement for Pine Flat dam is hauled by truck from Calaveras Portland Cement Co.'s plant at San Andreas, Calif. Type II cement, a modified low heat cement, is used with "Air-In" as the air-entraining agent. This additive is a California product. Air entraining requirements parallel those of most construction jobs of this type following the usual Corps of Engineers specifications. Concrete is placed with two high-lines, using two-compartment Garbo buckets of 8-cu. yd. capacity. Electric vibrators are used in the placing. The total yardage of concrete to be placed is 2,200,000 cu. yd. The batching plant is a Noble plant utilizing four 4-cu. yd. Smith mixers. Timers are used on the mixers.

The coarse aggregates at the batching plant are cooled using the High-tower cold air system with ice chips added to the mix if weather conditions require it. Portland cement is cooled in a battery of three Christian cement coolers, which consist of screw-type conveyors with hollow flights through which cooled water is pumped. In addition, in the truck unloading hopper used by the cement trucks is a series of pipe through which cooled water flows so that the cement is somewhat cooled before being elevated to the two steel storage silos holding a total of 15,000 bbl. Low pressure air-activated gravity conveyors (F-H Airslides) are used to deliver cement from the silos to the bin over the batchers, with a Fuller-Kinyon pump available as a standby. This unit was installed because it was found that sometimes the cement would be lumpy or contain foreign matter, and would pile up at the inlet area of the Airslides, thereby inhibiting their action. A Weston indicating thermometer is inserted in the cement line to the silos so that portland cement temperatures can be observed. No attempt is made to cool the fine aggregates.

The use of an interior two-bag mix, with the type of cement used, gives 7-day strengths of about 600 p.s.i. and in 28 days, 1200 p.s.i. In such concrete the water is 9½ gal. per bag with a resulting slump of 1¾ to 2 in.

A dam of this type depends upon the weight of the mass of concrete to hold back the water. In most cases a static pressure is the main component and impact does not enter into the picture except to a minor degree. Adequate inspection and drainage galleries are provided throughout the mass, as well as plumb line shafts to detect any movement in the structure. The use of a two-bag mix for the interior concrete is considered adequate. However, the work at the dam will be followed with much interest in the years ahead.

Additional statistical data relating

Fig. 16, left: Radial stacker on the raw minus 4-mesh sand that is delivered from Plant No. 1 to Plant No. 2. The sand is withdrawn through a reclaiming tunnel for further sizing and reblending to make the final concrete sand. A tractor is also used for additional reclaiming. Fig. 17, right: Radial stacker for finished sand, being piled for drainage. The 4000-ft. belt conveyor which delivers sand to the batching plant above the construction site can be seen in the background

to the Pine Flat project are as follows:

The dam:	
Maximum height	440 ft.
Width of crest	32 ft.
Length of crest	
Right abutment non-overflow section	789 ft.
Spillway section	292 ft.
Left abutment, non-overflow section	739 ft.
Total length of dam	1820 ft.
The spillway:	
Number of radial gates	six
Size of radial gates	42 x 38 ft.
Number of conduits	ten
Size of conduits	5 x 9 ft.
The reservoir:	
Length	19 miles
Shoreline	67 miles
Area (maximum)	6300 acres
Capacity (maximum)	1,110,000 acre-ft.

Personnel

Pine Flat dam is being built under the direction of the Corps of Engineers, U. S. Army (Sacramento, Calif., district), by Pine Flat Contractors, a composite of: Guy F. Atkinson Co.; Bresi & Bevanda Constructors, Inc.; Charles L. Harney, Inc.; J. A. Jones Construction Co.; and A. Teichert & Son, Inc.

Earl Jennett is project manager for Pine Flat Contractors; Guy Hiemsoth is assistant project manager; George Archibald is general superintendent; Richard G. Rofelty, project engineer; and George Forus, aggregate superintendent.

For the Corps of Engineers, R. B. Jenkinson is project engineer; C. F. Beatie, assistant project engineer; R. A. McDonald, office engineer; and W. G. Mitchell, concrete technologist.

Fig. 18: Pine Flat dam, on the Kings river in California, is a concrete gravity-type dam. Batching plant and cement silos are on the side of the mountain in the right background

Plastering and Lathing Standards Revised

TWO STANDARDS prepared by Sectional Committee A42 on Specifications for Plastering of American Standards Association have recently been published in booklet form and contain a few important revisions. The standards are American Standard Specifications for Gypsum Plastering, A42.1-1950 and Specifications for Interior Lathing and Furring, A42.4-1950. These specifications were formerly combined in one standard. The principal change in the gypsum plastering standard refers to proportions: the one part gauging plaster to three parts lime putty proportion given in previous editions has been changed to one part of gauging plaster to not more than three parts of lime putty, by volume. It was agreed that the earlier requirement of 1:3 by volume was unworkable in the absence of tolerances. Various defects cropped up with use of lime content exceeding three parts.

Perlite has been accepted as an aggregate for plaster. This revision has been incorporated in the new edition; vermiculite had previously been accepted. Neither perlite nor vermiculite is recognized in Specifications A42.1-1950 for use as an aggregate in the finish coat.

At the time of adoption of the 1946 revision, when the then novel restriction was for finish coats to contain no more than 8 percent of unhydrated oxide in the limes, no more than three manufacturers in the country were commercially producing finishing hydrate meeting this specification, the American Standards Association has reported. Now the situation is reversed: probably no more than three manufacturers can not meet the specification. Also, in 1946 the subject was highly controversial; in contrast, no opposition was met in drawing up the 1950 edition.

Corporation Change

MICHIGAN LIMESTONE & Chemical Co., Detroit, Mich., as of January 1, became a general operating division of U. S. Steel Co. and now operates under the name of Michigan Limestone Division, U. S. Steel Co. Michigan Limestone Division will succeed to all the properties and rights of Michigan Limestone & Chemical Co. and will assume all of the responsibilities and obligations of that company.

Britain's Newest Cement Plant

Wet process mill utilizes chalk as principal raw material. The 350-ft. kilns have enlarged burning zones

The new Shoreham plant of British Portland Cement Manufacturers, Ltd., has to a large extent been built in the quarry of the old plant. Modern ideas of material handling and storage were followed so far as the site would allow. The plant has a capacity of 350,000 tons of cement per year and is one of the largest in Europe

OF THE EIGHT OR NINE companies comprising the cement industry in England, British Portland Cement Manufacturers, Ltd., is the largest. Of the more than 9,000,000 tons of cement produced in Great Britain in 1950, British Portland Cement produced between 6,000,000 and 7,000,000 tons. The company celebrated its 50th anniversary in 1950, although some of the individual plants have been in existence for 100 to 140 years.

British Portland Cement Manufacturers' latest addition is the plant built near Shoreham, Sussex, England, which started production in 1951. With a capacity of 350,000 tons a year, it is one of the most modern plants in the world and one of the largest in Europe. It was built to replace a small plant which had been in operation for the past 50 years, and it represents an investment of approximately $7,000,000.

A definite attempt was made to fit the plant into a rural area so that it is not obtrusive. The valley of the Adur river, running north to south, cuts through the chalk hills in that part of England and empties into the sea at Shoreham. On both sides of the valley the downs rise sharply to 300 ft. A quarry on the east bank has been used for the past 80 years to supply chalk for the old cement plant. The greater part of the new plant is in this quarry and, since the back face of the quarry is 180 ft. high, the only part of the new plant which is visible from the north or south is the top of the 300-ft. stack.

Due to site restrictions the main railroad sidings, coal handling plant, cement packing plant, new office, canteen and laboratory buildings are situated on the site of the old plant. Modern ideas of handling and storage of large quantities of bulk materials have been followed so far as the site will allow. The existing quarry floor is roughly at road level, and the hard chalk provides a good foundation and a fairly level site.

Raw Materials

The clay used in cement manufacture is obtained from a pit about three miles from the plant. It is dug by a bucket excavator of 75 t.p.h. capacity and is fed on to 24-in. belt conveyors approximately 1100 ft. long in two sections. That is the length of the face of the pit. These belts feed into a 25-ft. diameter washmill. (The washmill is a unit in which a series of harrows are rotated around a center king post. Around the periphery are gratings or sieves to control the size of the product discharged.)

Water is added to the clay in the ratio of 2:1. The clay slurry is stored temporarily in a storage mixer 50 ft. in diameter, from which it is pumped down to the plant through a 3-mile long underground pipe line. The slurry is pumped by three-throw high pressure pumps through 8-in. steel pipe to the storage tank adjacent to the chalk washing plant.

Chalk is dug from the top of the 300-ft. hill behind the plant and the company intends to work down in 40-ft. benches until the original quarry floor is reached. The chalk is soft enough to wash and the flint contained in it is an aid to size reduction. It is excavated by a 3½-cu. yd. electric shovel.

Crushing and Washing Plant

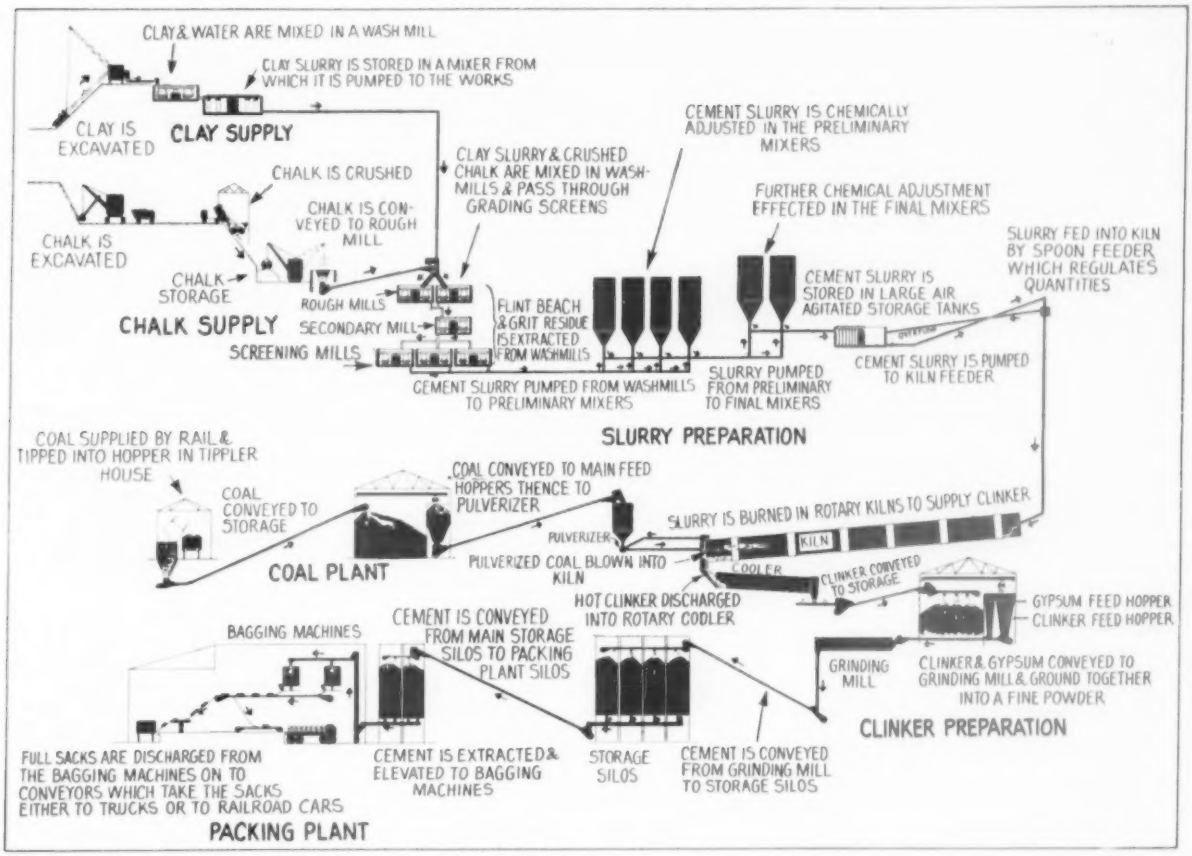
For many years the chalk will be excavated considerably above the general level of the plant, and a large crusher has been installed at high level with a gravity chute into storage at the plant below. The material is transported from the quarry by 9-cu. yd. skips on a 1:11 grade, which discharge into the large-toothed roll crusher already mentioned. The crusher is capable of reducing the chalk from chunks up to 2 tons in weight to minus 10-in. size. After passing through the crusher, which can handle up to 300 t.p.h., the material falls by gravity down a steel-lined chute to a stockpile. The stockpile provides a little more than 24 hours' supply for the washing plant. An electric crane with a 5-ton bucket takes the material from storage at the rate of about 100 t.p.h. and delivers it to a 20-ton feed hopper, from which a feeder discharges it on to 30-in. belt conveyors feeding directly to the slurry washing plant.

One feature of this plant is that there are practically no elevators, only two in the packing plant. All conveying is done by inclined belts where elevation is necessary, and by drag chain conveyors when conveying horizontally.

The two raw materials, clay and chalk fines, are discharged to a common point where, in a series of washmills, primary, secondary and tertiary, they are blended and reduced to a slurry with a residue of 4 percent on a 170-mesh sieve.

Two 35-ft. diameter rough mills, one 35-ft. secondary mill, and three 35-ft. screening mills reduce and screen the chalk to slurry. The drives are a new development, incorporating gear boxes, with a final drive of straight spur-wheel and pinion in place of the more conventional bevel-wheel and pinion. The rough and secondary mills are driven by 350-hp. motors, and the screening mills each by a 100-hp. motor. The flint and grit are extracted from the chalk during the washing process and a separate washing plant processes this material into a salable by-product. The wash water passes through a classifying and thickening system and is returned for re-use.

The company has introduced into


CLAY & WATER ARE MIXED IN A WASH MILL
CLAY SLURRY IS STORED IN A MIXER FROM WHICH IT IS PUMPED TO THE WORKS
CLAY IS EXCAVATED
CLAY SUPPLY
CHALK IS CRUSHED
CHALK IS CONVEYED TO ROUGH MILL
CHALK IS EXCAVATED
CHALK STORAGE
CHALK SUPPLY
ROUGH MILLS
SECONDARY MILL
SCREENING MILLS
CLAY SLURRY & CRUSHED CHALK ARE MIXED IN WASH-MILLS & PASS THROUGH GRADING SCREENS
FLINT BEACH & GRIT RESIDUE IS EXTRACTED FROM WASHMILLS
CEMENT SLURRY PUMPED FROM WASHMILLS TO PRELIMINARY MIXERS
CEMENT SLURRY IS CHEMICALLY ADJUSTED IN THE PRELIMINARY MIXERS
FURTHER CHEMICAL ADJUSTMENT EFFECTED IN THE FINAL MIXERS
SLURRY PUMPED FROM PRELIMINARY TO FINAL MIXERS
CEMENT SLURRY IS STORED IN LARGE AIR AGITATED STORAGE TANKS
OVERFLOW
CEMENT SLURRY IS PUMPED TO KILN FEEDER
SLURRY FED INTO KILN BY SPOON FEEDER WHICH REGULATES QUANTITIES
SLURRY PREPARATION
COAL SUPPLIED BY RAIL & TIPPED INTO HOPPER IN TIPPLER HOUSE
COAL CONVEYED TO STORAGE
COAL PLANT
COAL CONVEYED TO MAIN FEED HOPPERS THENCE TO PULVERIZER
PULVERIZER
PULVERIZED COAL BLOWN INTO KILN
SLURRY IS BURNED IN ROTARY KILNS TO SUPPLY CLINKER
KILN
COOLER
CLINKER CONVEYED TO STORAGE
HOT CLINKER DISCHARGED INTO ROTARY CODLER
GYPSUM FEED HOPPER
CLINKER FEED HOPPER
BAGGING MACHINES
CEMENT IS CONVEYED FROM MAIN STORAGE SILOS TO PACKING PLANT SILOS
GRINDING MILL
CLINKER & GYPSUM CONVEYED TO GRINDING MILL & GROUND TOGETHER INTO A FINE POWDER
CLINKER PREPARATION
FULL SACKS ARE DISCHARGED FROM THE BAGGING MACHINES ON TO CONVEYORS WHICH TAKE THE SACKS EITHER TO TRUCKS OR TO RAILROAD CARS
CEMENT IS EXTRACTED & ELEVATED TO BAGGING MACHINES
STORAGE SILOS
CEMENT IS CONVEYED FROM GRINDING MILL TO STORAGE SILOS
PACKING PLANT

Flowsheet of the Shoreham cement plant

the washing plant an efficient method of removing flint, which amounts to about 5 percent of the total. At all three stages in the washing plant, flint extraction takes place. The rough or primary mills are run on alternate days and the flint pieces are removed from the mill when it is stopped, through a sliding door in the mill bottom. Underneath the rough mills is a flint washing plant. The large pieces of flint from the rough mills, which are almost pure silica, can be sized, washed and sent to local potteries. The finer flint from the secondary mill are commonly called "beach." They vary from 1 in. down and are claimed to make good aggregate. The sand which is removed continuously from the bottom of the tertiary mills is a mixture of finely ground flint and unwashed chalk; this material is wasted.

The chemical composition of the finished slurry is maintained between close limits; the carbonate content is limited to a ± 0.1 percent variation from the desired figure. Tests for quality are made every hour, or oftener if necessary, and the separate quantities of raw materials are adjusted accordingly. To facilitate testing and mixing, there are four preliminary blending tanks, each of concrete construction 54 ft. high and 23 ft. diameter, into which the slurry is delivered by centrifugal pumps. From these tanks the slurry is pumped into final correcting tanks 76 ft. high and 27 ft. in diameter. The slurry has then been corrected for chemical composition and is allowed to flow by gravity into three storage tanks, each 66 ft. in diameter and 15 ft. high. Air agitation is used throughout in the blending and storing tanks. The slurry is pumped from the storage tanks to the two kilns by ram pumps, with variable-speed spoon feeders to control the quantity delivered to each kiln.

The slurry which is fed to the kilns is approximately 41 percent moisture. The chalk, three-fourths of the mix, is comparatively dry, normally carrying 8 to 10 percent water. Water is added from the underflow of the Dorr thickener to bring the final moisture of the kiln feed slurry to 41 percent. This is a rather high percentage, but with this particular operation the moisture cannot be reduced lower without causing operating difficulties in handling. Also, the discharge screens on the tertiary washmills are 32 mesh. Slurry with a low moisture content would be too viscous to wash through these screens at the desired output.

Kiln Operation

Each of the two kilns is 10 x 350 ft. with an 11 ft. 6 in. enlarged diameter burning zone, and has an output of more than 20 t.p.h. They incorporate many features resulting from practical experience with many types of rotary kilns and coolers during the past 40 years.

The kilns are fired by pulverized coal and have induced draft. Slack coal is obtained from the Kent coal fields by rail. The hopper cars are unloaded at a tipple into a feed hopper over a high-level belt conveyor. Other belt conveyors transport the coal to an indoor stockpile or to feed hoppers over the coal pulverizing mills. There are two mills for each kiln, which permits periodic overhauling of the coal mills without stopping the kilns. Reinforced concrete coal bunkers of 700 ton capacity have been constructed.

Each kiln has an electrostatic stack dust collector operated under suction from induced-draft fans and exhausting into the 300-ft. reinforced concrete stack which is lined with brick.

The clinker discharges from the

kilns at a temperature of about 2000 deg. F. and is put through separate 9- x 90-ft. rotary coolers which reduce the temperature of the clinker to 250 deg. F.

After discharging from the coolers the clinker is conveyed by duplicate shaker-conveyors to belt conveyors, which deliver either into the main clinker storage or directly to a conveyor discharging into the grinding mill bins. The shaker-conveyors are fitted with screens so that only 1½-in. material is delivered on to the belt conveyor. Oversize is delivered into a pit in the main clinker storage from which it is recovered by an overhead crane and passed through a crushing unit. Crushed clinker is also taken into the main clinker storage by an overhead crane.

The cement grinding mill comprises two 8-ft. 4½-in. diameter x 45-ft. mills, a 7-ft. 6-in. diameter x 40-ft. unit, and one smaller mill taken from the old plant. The mills are driven by 1200-, 800- and 400-hp. motors, respectively. Their maximum output is about 30 t.p.h.

About 8 hours' supply of clinker is provided in the grinding mill bins. The feed to all the mills is by band feeders, the speed of which is automatically controlled. Separate bins for gypsum are provided over each mill, and band feeders are used to control the rate of feed to the mills.

Dust collecting equipment has been installed, wherever practicable, in all places where dust might be emitted. For example, every transfer point in the conveyor system for coal, clinker and cement has been connected to a duct collector. The total cost of the equipment installed to prevent dust contamination is approximately $365,000.

Storage

Finished cement is transported by a duplicate system of Redler and belt conveyors delivering directly to the 12 main storage silos which have a total capacity of 15,000 tons. From the bottom of these silos, cement is removed by Redler conveyors and inclined belts leading to two feed hoppers for the packing machines. As the packing plant has been built on the site of the old plant, remote from the main storage, two silos, each with a capacity of about 800 tons, have been provided at the packing plant.

The main storage for clinker, gypsum and coal extends the entire length of the kiln building. It is about 500 ft. long and provides space for 15,000 tons of clinker, 2000 tons of gypsum and 5000 tons of coal. Two overhead traveling cranes of 75-ft. span and with 5-ton buckets serve this storage area. Under normal operating conditions one crane is sufficient for handling of materials. Either crane can feed clinker and gypsum directly to the grinding mill bins. Coal is taken from storage to the bins on belt conveyors. The cranes can also be used in emergency to take the clinker from the screens either to storage or directly to the mill hoppers.

The packing plant is capable of loading at the rate of 200 t.p.h., 100 t.p.h. to trucks and 100 t.p.h. to railroad cars at the same time. Two 12-spout Fluxo packers have been installed. A system of belt conveyors takes the packed bags from either machine to the truck loading or rail loading bays.

There are facilities also for loading bulk cement. The company has some bulk containers for shipment of the cement, but the majority are owned by outside haulers.

Electric power is supplied by the British Electricity Authority; input voltage is 33,000 volts and is stepped down to 3000 volts for all motors over 100 hp. Motors with less than 100 hp. are 415 volts. Total installed power is between 9000 and 10,000 hp., and the anticipated maximum demand is about 5100 kv.-a.

The three-story office building incorporates, on the ground floor, chemical and physical laboratories, first aid room and men's locker room. The second floor contains the offices and the top floor comprises canteen, kitchen and dining rooms. One of the dining halls has been arranged so that it can be used for social functions.

Considerable care and attention has been paid to the architectural features so that the plant will be generally pleasing to the eye and not spoil the landscape. The plan and design of the plant were by the engineering staff of The Associated Portland Cement Manufacturers, Ltd., and Oscar Faber & Partners acted as civil engineering consultants. John Laing & Son, Ltd., was the main contractor. Bierrum & Partners, Ltd., was the subcontractor for the reinforced concrete work and Redpath, Brown & Co., Ltd., for the structural steel work, J. L. Kier & Co., Ltd., was the civil engineering contractor for the clay plant.

Lime Association Safety Competition

TWELVE LIME PLANTS received certificates for injury-free operations during the 1950 National Lime Association Safety Competition, conducted by the Bureau of Mines. These plants were awarded Certificates of Honor by the National Lime Association for their outstanding safety records during the year. At these 12 plants, the men worked an aggregate of 1,362,938 man-hours without any lost-time injuries, which was 15 percent of the total time worked at the 45 competing plants in 1950. The two lime plants with the largest totals of man-hours without injuries were operations which obtain stone from underground mines.

The injury experience of the 45 competing plants in 1950, however, was not favorable when compared with that of 1949. The injury-severity rate of 3.566 days of disability per 1000 man-hours was 79 percent above that of 1949. Also, the injury-frequency rate of 26.076 per 1,000,000 man-hours was 27 percent higher than in 1949. The severity and frequency rates were, however, lower in 1950 than the corresponding 16-year average rates since the competition started in 1935. Burns, handling materials, falls of persons, machinery, and falls and slides of rock were the leading causes of injuries at the competing plants in 1950. These causes resulted in 63 percent of all injuries on which causes were given.

Injury-Free Plants

The following plants received Certificates of Honor for their injury-free operations in 1950:

Quarries with calcining plants working 100,000 or more man-hours:

Galloway plant, Galloway, Mo., operated by Ash Grove Lime and Portland Cement Co.; 241,384 man-hours.

Quarries with calcining plants working less than 100,000 man-hours:

Evans plant, Evans, Wash., operated by United States Gypsum Co.; 96,363 man-hours;

Thomasville plant, Thomasville, Penn., operated by The J. E. Baker Co.; 88,056 man-hours;

Lee plant, Lee, Mass., operated by Lee Lime Corp.; 83,090 man-hours;

McCoy plant, Bridgeport, Penn., operated by Warner Co.; 74,715 man-hours;

Pearisburg plant, Ripplemead, Va., operated by Ripplemead Lime Co., Inc.; 34,688 man-hours;

Frederick City plant, Frederick City, Md., operated by Shank and Etzler Lime Co.; 6336 man-hours.

Underground mines with calcining plants:

Kimballton plant, Kimballton, Va., operated by National Gypsum Co.; 324,032 man-hours;

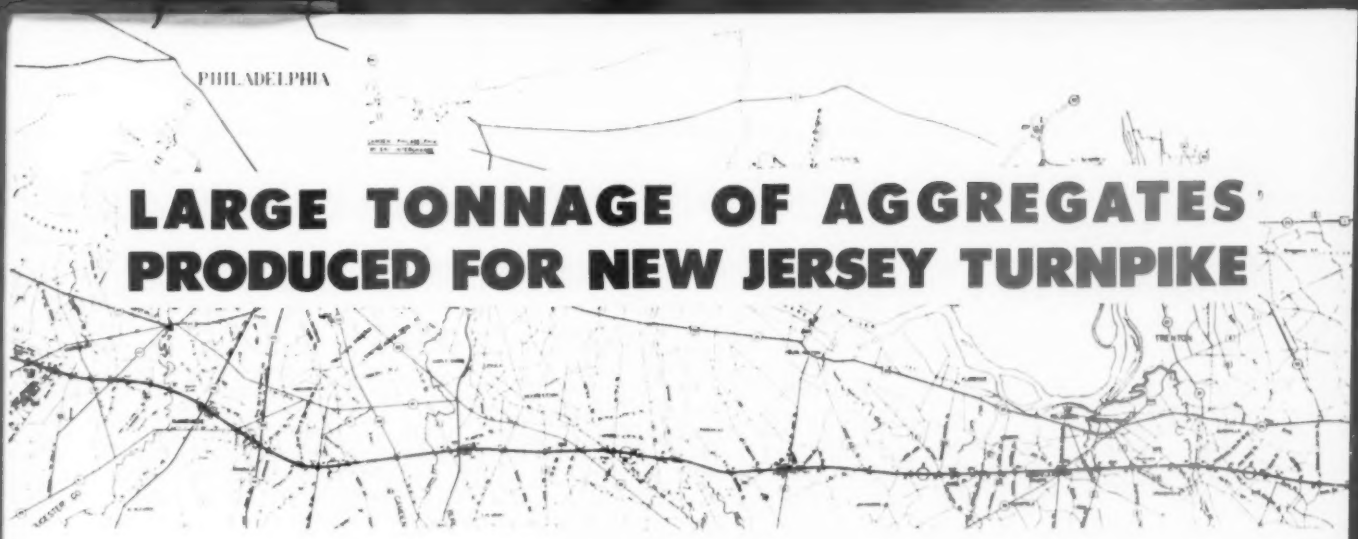
Kimballton plant, Kimballton, Va., operated by The Standard Lime and Stone Co.; 245,210 man-hours.

Calcining plants only:

Ludington plant, Ludington, Mich., operated by The Dow Chemical Co., Ludington Division; 77,248 man-hours;

Houston plant, Houston, Texas, operated by Nyotex Chemicals, Inc.; 52,672 man-hours;

Plymouth Meeting plant, Plymouth Meeting, Penn., operated by The Phillip Carey Manufacturing Co.; 39,144 man-hours.



LARGE TONNAGE OF AGGREGATES PRODUCED FOR NEW JERSEY TURNPIKE

Iowa producer set up equipment to produce nearly a million tons of crushed stone from Pennsylvania quarry

By ROBERT W. SPAKE

MUCH OF THE CRUSHED STONE used in the two southernmost sections of the New Jersey turnpike was quarried at Downingtown, Penn., by the Carbon, Texas, plant of Concrete Materials and Construction Co. of Cedar Rapids, Iowa. This was not quite as complicated as it sounds. Upon completion of Whitney dam, at Carbon, Texas, Concrete Materials and Construction Co. found it had a modern rock products plant with no place to put the product. However, this eventuality had been foreseen—the plant could be disassembled easily. Some acreage was leased adjacent to an existing quarry at Downingtown and the Texas plant was loaded on railroad cars and shipped north.

Erection at the new location was started in January, 1951, and was completed in March. Volume production began in April and continued through October 15, 1951. By the end of November the plant had been disassembled again, and partly sold.

On the peak production day, 14,000 tons were produced by the primary plant, and 9500 tons by the secondary. This was during two-shift operation.

It was estimated at the start of the job, as shown in Table I, that 618,500 tons of crushed stone would be produced. Actually, a total of 840,000 tons was produced, including 150,000 tons of scalpings.

Geologic History

The material at the Downingtown quarry utilized by Concrete Construction and Materials Co. is a hard and abrasive dolomite, eminently suitable for use in asphaltic concrete pavement as was used in the New Jersey turnpike.

According to the Pennsylvania Bureau of Topographic and Geologic Survey, the quarry is located in a Cambrian age formation, the Ledger dolomite. The Ledger consists chiefly of interbedded impure dolomite, shaley dolomite and marble. In this area, known as Chester Valley, these rocks have been folded intensely and recrystallized so that the original dolomite and marble are now dolomitic limestone and marble.

In the immediate area of the quarry, both a blue and a gray stone are found. Some of the physical properties of each are listed below.*

Gray stone	
Deval wear test	4.2 percent wear
Average toughness	11
Blue stone	
Deval wear test	3.8 percent wear
Average toughness	12
Los Angeles test, 500 revolutions	
A-grade (⅜-in. to 1½-in. dia.)	30.0 percent loss
B-grade (⅜-in. to ¾-in. dia.)	29.1 percent loss
Average specific gravity	2.80
Percent absorption	0.34

The narrow belt of limestone in which the quarry is located is more than 55 miles long. It is the southernmost belt of limestone suitable for aggregate in the Philadelphia area. The narrowness of the limestone belt is due to the intense folding of the rock strata here. As might be expected, the deposit is quite deep.

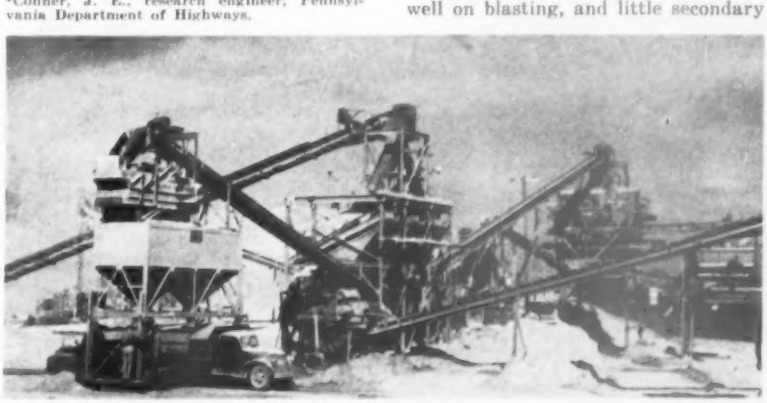
*Conner, J. E., research engineer, Pennsylvania Department of Highways.

Quarrying

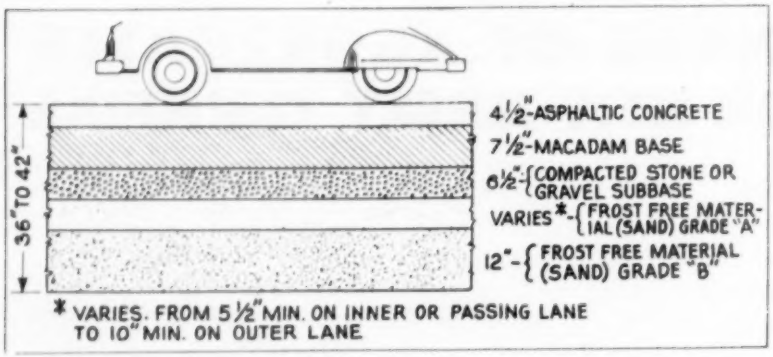
While the Concrete Materials and Construction plant was being reerected, shallow overburden was removed, and preparations for actual quarrying begun. Two 29T Bucyrus-Erie well drills, and one Model 1000 Cyclone well drill were used to drill 8-in. blast holes. In the busiest part of the summer, additional 8-in. and 5½-in. rotary and churn drills had to be rented.

Atlas explosives were used exclusively, and Atlas delayed action blasting caps were found to be very effective. As many as 17 delays were used with excellent results, cutting down noise and vibration, which were somewhat of a problem in this location.

The rock was found to fragment well on blasting, and little secondary



The secondary crushing and screening plant of Concrete Materials and Construction Co.'s Downington, Penn., operation. The conveyor on the left carries material up from the surge pile atop the 96-in. reclaiming tunnel onto three double-deck vibrating screens. Washed stone goes by conveyor to bin on extreme right. Smaller stone goes to sizing tower and bins in extreme rear

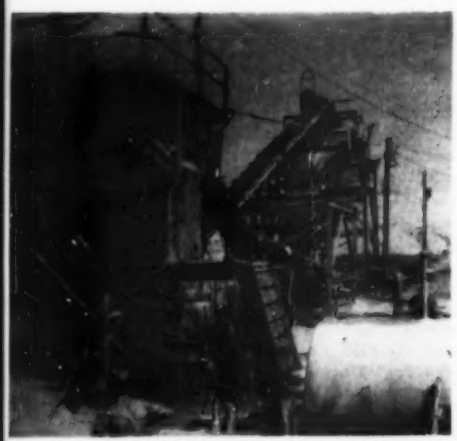

4½"-ASPHALTIC CONCRETE
7½"-MACADAM BASE
6½"-{COMPACTED STONE OR GRAVEL SUBBASE
VARIES*-{FROST FREE MATERIAL (SAND) GRADE "A"
12"-{FROST FREE MATERIAL (SAND) GRADE "B"
36" TO 42"
* VARIES. FROM 5½" MIN. ON INNER OR PASSING LANE TO 10" MIN. ON OUTER LANE

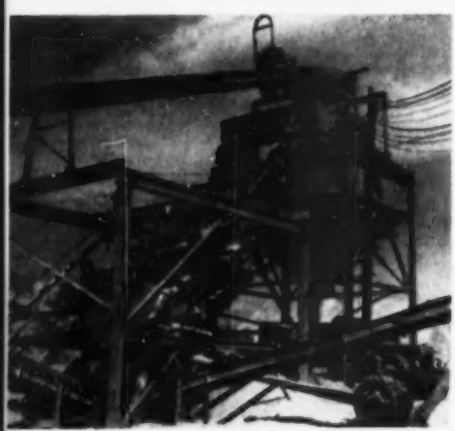
The turnpike is made up of nine layers, totaling 36 to 42 in. in depth at the center of the roadway

Construction of

WHEN BIDS WERE submitted, over a year ago, it was decided that more than $5,000,000 could be saved on the 118-mile superhighway if asphaltic concrete were used exclusively, in place of portland cement concrete. Since it was felt by the turnpike authority that either type of pavement would provide an excellent highway, the decision in favor of asphaltic concrete was made.

The turnpike itself, as finally





Top: The double-impeller impact breaker was driven by two diesel units through V-belt drive. Surge pile storage over a reclaiming tunnel can be seen in right rear. Center: Tipple where stone was washed and sized. Bottom: Stone being loaded into railroad cars. It was also possible to load trucks from other bins at the same time that railroad cars were being filled

breakage was necessary. Occasionally a 2500-lb. drop ball was brought over from the neighboring quarry for this work.

In the course of the summer, a good-sized hole was made, and at the close of operations the quarry face was about 700 yd. long, and ranged from 30 to 60 ft. in height. A 3½-cu. yd. Lima shovel and a 1½-cu. yd. Lima shovel and a 1½-cu. yd. Northwest shovel were used to load 15-cu. yd. Euclid rear-dump quarry trucks, Cummins diesel powered. At peak periods two 8-ton Koehring Dumptors were used to help out. These vehicles hauled the broken stone no more than 500 yd. to a large combination surge and dumping bin, which was set over a 50-in. x 14½-ft. Cedarapids apron feeder. Quarry-run stone was taken through a chain and rubber belting curtain by this feeder, and dropped onto a nonvibrating scalping grizzly. Bars on this machine were set 5 to 6 in. apart.

Plant Operation

Material passing through the grizzly was assumed to be dirty, and was delivered by a 30-in. x 104-ft. belt conveyor to a small, separate screening installation. Two 4- x 8-ft. Iowa double-deck vibrating screens, mounted on top of a bin, were used to accept or reject material at this point. The top deck of these screens was 1½-in. mesh, the lower deck, ¾-in. mesh.

Weather dictated the acceptance size limit, due to the presence of mud which filtered down into the uptilted cracks in the rock formation. In wet weather, all minus 1½-in. material was dumped into the waste bin, but in dry weather only the minus ¾-in. material was scalped off. Scalpings were hauled from the waste bin to a dump pile by hired trucks. Flop gates were used to divert the flow of stone from the screen as desired.

Accepted stone from this plant was sent directly to a 6- x 14-ft. F-800 Tyler Ty-Rock screen, powered by a 20-hp. motor. Plus 3½-in. material was returned to the primary crusher, minus 3½-in. material was placed on

Table I. Stone sizes, screen analyses and tonnages

Sieve size	Percent passing	Typical gradation
Size 3 stone (PBM stone)—350,000 tons required		
2½ in.	100	98.7
2 in.	70-90	75.0
1½ in.	30-55	36.0
1¼ in.	0-15	13.0
1 in.	0-7	4.0
200 mesh	0-2	0.2
Size 2 stone (PBM choke)—15,000 tons required		
1 in.	100	100.0
⅝ in.	45-75	72.0
⅜ in.	25-45	26.0
4 mesh	0-10	3.0
10 mesh	0-2	1.0
Size 2A (Chips for seal)—3000 tons required		
⅝ in.	100	100.0
⅜ in.	95-100	50.0
4 mesh	20-50	6.0
10 mesh	0-15	1.5
30 mesh	0-2	1.0
Size 1 (Asphalt concrete)—100,000 tons required		
¾ in.	100	100.0
½ in.	70-80	75.0
⅜ in.	45-55	50.0
4 mesh	5-12	6.0
8 mesh	0-5	2.0
Size 1A (Asphalt concrete)—7500 tons required		
1 in.	100	99.5
¾ in.	70-80	75.0
½ in.	0-10	7.0
Size 1B (Asphalt concrete)—30,000 tons required		
⅝ in.	100	100.0
½ in.	95-100	96.0
⅜ in.	40-60	45.0
4 mesh	0-10	3.0
Size 1C (Asphalt concrete)—13,000 tons required		
5/16 in.	100	100.0
4 mesh	40-50	41.0
8 mesh	0-10	8.0

The above figures represent original estimates for the job.

the New Jersey Turnpike . . . . . .

constructed, is made up of nine layers, totaling 36 to 42 in. in depth at the center of the roadway. Three of these layers are in the top 4½ in., and are the actual asphaltic concrete. Beneath this is the so-called choke stone, overlaying the larger penetration stone. These layers run 3 in. and 4½ in. in depth, respectively, for a total of 7½ in. Beneath this is found a two-course layer of graded gravel or stone subbase, 6½ in. deep, for a total of 18½ in. of road material using manufactured aggregate.

Below all this lies two more graded and compacted "frost-free" layers, over the common embankment.

Contracts for the turnpike were let in seven sections, and stone for the southern two sections was supplied by Concrete Materials and Construction Co. Downingtown quarry. Dean Curphy was superintendent of the operation. This involved about 40 miles of four-lane roadway.

Contractor for the southern section, section one, was S. J. Groves and Sons Co.; for section two it was A. I. Savin Construction Co.

The New Jersey turnpike is designed for high-speed and high-density traffic, and is engineered to permit axle loads of up to 36,000 lb. Total cost of the project will run in the neighborhood of $240,000,000; about $40,000,000 was for paving.

the main 30-in. x 230-ft. belt conveyor going to the surge pile.

Material which did not pass through the grizzly fell directly into a 5050 Cedarapids double impeller impact breaker. This machine was purchased especially for the Downingtown operation, since only the secondary plant came from Texas. In this unit quarry-run stone was reduced to about 3½ in. by two rotors turning at 300 r.p.m. Much of the breakage occurred while the stone was still in suspension, giving a high reduction ratio. Broken material passed through bars, which further aided in breaking the stone. The impact breaker was powered by two D-17000 Caterpillar diesel units, each connected by a six-strand Gates V-belt drive.

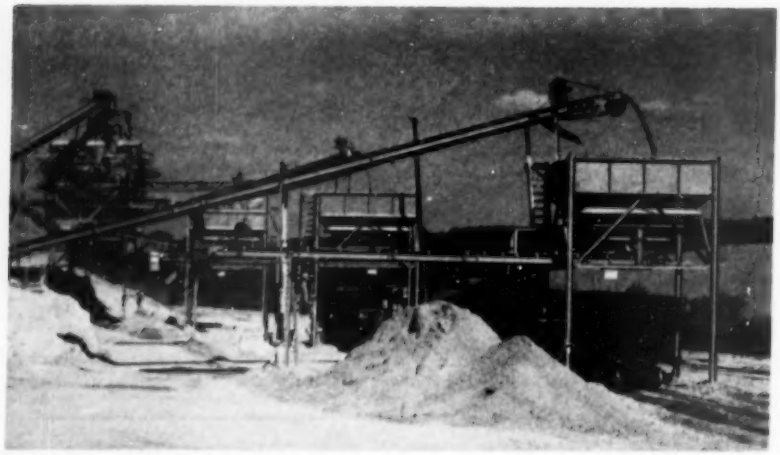
Crushed material dropped onto a 36-in. x 88-ft. belt conveyor leading to a small surge bin. A 36-in. x 8½-ft. Iowa apron feeder took material from this bin to the main 30-in. x 230-ft. surge pile belt conveyor mentioned previously. This conveyor angled upward steeply, permitting a large surge pile, good protection against emergency shut-downs in the primary plant. It also permitted the primary to continue operations when it was necessary to close down the secondary plant for one reason or another. Peak size of the pile during summer operation was about 25,000 tons.

The surge pile itself was placed over a 96-in. diameter Armco steel pipe, which was approximately 200 ft. long. Two openings in the top of this pipe allowed stone to enter by gravity. Two Cedarapids apron feeders inside the pipe discharged onto a 30-in. x 130-ft. belt conveyor, running two-thirds the length of the pipe. The surge pile was dressed by an Allis-Chalmers HD-19 tractor with a bulldozer attachment.

Material discharged off the tunnel belt onto a 30-in. x 122-ft. conveyor, running at 550 ft. per min., which took the stone to the secondary plant. At the head pulley of this conveyor, the flow of stone was divided into three parts by means of chutes. Three 4- x 12-ft. double-deck F-600 Tyler Ty-Rock vibrating screens, each with a 20-hp. motor, began the sizing operation. Two sizes of cloth were used on the top deck of these screens: 2¾-in. square mesh on the first section, and 2½-in. square mesh on the second section. All cloth on the lower deck of these screens was 1½-in. mesh. Material passing through the top deck, but retained on the lower deck, was No. 3 penetration stone (see Table I). A short belt conveyor dropped this stone to one side of the screening tower onto a 4- x 12-ft. Iowa single-deck washing screen, with ½-in. square screen cloth.

Water for the washing operation was pumped from a creek about one-half mile away by an Allis-Chalmers 8 x 8SH pump with a 100-hp. motor. This pump was mounted on a tower

Top: View of the secondary plant with ground storage in the foreground and loading bins along the right. Right: Surge piles were used extensively as a guarantee to continuity of production. Below: Hammermill and preliminary secondary screening tower. Material retained on the top decks of the three vibrating screens was conveyed to the hammermill, which discharged minus 2½-in. material; the material was recycled back through the screening tower



Stone from the bins could be loaded into either railroad cars or trucks, or both

in the center of the creek. A second Allis-Chalmers pump, a 6 x 5S, with a 75-hp. motor, was installed as a spare. The spare pump was mounted on a boat anchored in the creek.

Tailings from the washing operation were pumped from a hopper below the 4- x 12-ft. screen by an Allis-Chalmers 5 x 4CWH-11 pump, with a 20-hp. motor, and were dumped into an abandoned quarry hole, which served as a settling pond. Clear water was returned to the stream.

Washed penetration stone traveled by belt conveyor to a 75-ton capacity bin placed over the company siding, served by the Reading railroad. Cars were spotted under the bin by Concrete Materials' 25-ton General Electric diesel-electric locomotive. The bin was so arranged that both trucks and railroad cars could be loaded simultaneously. All stone destined for the New Jersey turnpike was sold f.o.b. cars or trucks, Downingtown.

Material retained on the 2½-in. top deck of the three Tyler F-600's was brought by belt conveyor to a 40- x 33-in. Iowa hammermill. This machine, whose grate bars were set at 3-in., discharged generally minus 2½-in. material onto a belt conveyor. This, in turn, transferred onto the 30-in. x 122-ft. conveyor feeding the three Tyler F-600's, and the material was recycled.

Material passing through both decks of these screens (minus 1½ in.) was chuted onto a 30-in. x 143-ft. conveyor, which lifted the aggregate up to three triple-deck 4- x 12-ft. Iowa dry screens. Feed was divided evenly between the screens by chutes. Cloth on these screens was changed according to the size material desired. All three screens could be producing the same size stone at once, but this was not required unless desired. Four sizes of stone were made at this station (see Table I).

Sometimes it was necessary to put a ¾-in. mesh screen on the first section of the bottom deck of one of the F-600 screens to scalp off small stone and ease the load on the small stone plant. Four to eight mesh was generally the bottom limit of acceptable material. Smaller stone were classed as screenings and were discarded.

Depending upon needs, a portion of the through material from the three Iowa screens could be diverted to a 4- x 12-ft. Iowa double-deck screen mounted over another 75-ton bin. Oversize from this screen could be recycled, and through material went into the bin for shipment.

Material classed as oversize by the small stone plant was returned, by belt conveyor, to the hammermill station. Here, another 40- x 33-in. Iowa machine, Caterpillar diesel powered, and a 49-in. Williams "Super-Slugger," powered by a Murphy ME-66 power unit, further reduced the material. A single belt conveyor took the discharge of all three hammermills back to the F-600 screens for resizing.

Accepted material in one of the five 75-ton bins was either loaded out for shipment as outlined above, by rail or semi-trailer truck, or was stockpiled by the Koehring Dumptors. A ¾-ton Unit Model 1020 shovel was used to take material from stockpile for shipment.

A field laboratory for the use of the customers was maintained at the quarry. A Gilson mechanical testing screen, Tyler Ro-tap, and an O'Haus scale were supplied, as well as a small electric oven for moisture determinations. As shown in Table I, seven sizes of stone were normally produced.

Due to the abrasive effects of the stone on equipment, it was necessary to do a great deal of hard facing of wearing surfaces with Stoody 21 rods (high manganese). Two Hobart welding machines and one Lincoln welder were kept busy all summer. Good results were reported using this method, although the high-manganese iron, which precluded magnetic recovery, gave the operators some tramp metal trouble.

Cement Raw Materials in Alaska

THE GEOLOGICAL SURVEY recently completed a survey of Alaska to determine the potential sources of raw materials for cement. The high cost of imported cement and the strategic advantages of having a local source of supply for the military establishment were the essential reasons for renewed interest at this time in the possibility of cement manufacture in interior Alaska. Limestone deposits were found in the Windy Creek area and, with the accessibility of rail transportation and principal interior markets, this location was considered to be the most desirable for constructing a cement plant.

The investigation of cement raw materials disclosed three limestone deposits of commercial size in the Devonian rocks of the Alaska Range near Windy Creek; 24 deposits of various types of argillaceous materials (clays and shales) in the Healy River and Windy Creek areas; sufficient fuel from mines in the Healy River area; and gypsum at Sheep Mountain, 120 miles to the southeast.

A report on the investigation is available for public inspection in the Geological Survey offices at Washington, D. C., Room 4215, General Services Administration Bldg.; San Francisco, Calif., Room 100, Old Mint Bldg.; Juneau and Fairbanks, Alaska; and at the Bureau of Mines office in Anchorage, Alaska.

British Industries Fair

THE 1952 BRITISH INDUSTRIES FAIR will be held in London and Birmingham, England, May 5-16. Overseas attendance is expected to be even greater than last year's record attendance of 19,266, which was the largest overseas attendance in the 36-year history of the fair. Advance booking of space indicates a complete sell-out of the more than 1,000,000 sq. ft. of available exhibit space.

The exhibit will include, in part:

(1) Engineering: mechanical handling of materials; prime movers, water turbines, steam boilers, steam, gas and oil engines and associated equipment; engineering instruments for indicating, recording and control purposes; industrial filters; plants for industrial purposes—cement, rubber, textiles, paper, plastics, chemicals, packaging machinery, etc.

(2) Quarry, mining, colliery, road and oil field: machinery and equipment; compressors, drills, excavators, trench pumps, crushers, screens, concrete mixers; pipe, culverts, manhole and drain covers; cement, road metal; hoists, derricks, cranes and lifts.

(3) Transport: locomotives, rolling stock and equipment; trucks; components and accessories of mechanically-driven road vehicles.

HIGH CAPACITY SHAFT KILNS

Small kilns of Dominion Lime Ltd., Quebec, Canada, converted to induced draft and center burner firing

By GORDON R. LACY*

THE MODERNIZATION OF SMALL vertical kilns into high capacity units by Dominion Lime Ltd. at its Lime Ridge, Quebec, Canada, plant is now receiving the attention of the lime industry. These small, highly efficient and highly productive, automatic Azbe patented kilns may well be the forerunner of a new concept of vertical kiln operation. They may provide reason for further consideration for remodeling existing kilns previously thought too small or too low for practical consideration, as well as for the building of new small, compact, high capacity units.

The quarrying and lime burning operation at Lime Ridge has been in production since 1835. Over the years, this plant, now owned by Dominion Lime Ltd., has expanded to produce several lime products. These include such brands as "Spredmor" and "Glizee" which are crushed quicklimes; "Rock City," a waterproof quicklime; "Bulldog" and "Adhesive" hydrated limes; and "Agstone," Dominion Lime's registered trademark in Canada describing certain pulverized limestones.

Prior to 1949, the plant was operated as a subsidiary of a nearby paper company, supplying a major portion of its output to the parent company. Studies were made for modernizing the plant but because of apparent high costs involved nothing was done. Finally the plant was sold to other interests and the situation re-examined toward bringing the plant into line to produce larger capacities of high quality lime at lowest possible cost. Consideration was given to the possibilities of remodeling the existing kilns, to installation of new vertical kilns, and to the use of a rotary kiln. In the final analysis it was the recommendation of the Azbe Corp. that the development program center around remodeling the existing steel shell kilns in conjunction with certain changes in the quarry operation.

Up to this time the quarry was a manual loading operation, the stone being hauled to a bin at the quarry from which it was drawn into trucks for the haul to the kiln and "Agstone" plants. The bulk of this manual labor is now eliminated with the introduction of a power shovel as the principal piece of equipment at the quarry, supplemented by a front end loader for auxiliary cleanup and loading. Loading is directly to the trucks for haulage to a new primary crushing plant near the kilns where it is crushed and sized for kiln use, the smallest fractions being stockpiled for use in the "Agstone" plant.

The original plant site about a mile from the present plant is shown in the photograph. The kiln plant more recently operated consists of two groups of five kilns each. The five older kilns were low, squat affairs built with heavy masonry walls, fired manually from two side fireboxes with wood or coal or a mixture of the two. The lime was drawn manually from a level almost as high as the fireboxes, thus permitting practically no cooling of the lime in the kilns. As it was drawn, it was spread on the floor where it was sorted for core as it cooled, then rehandled for shipment or further processing.

The other group of five kilns were somewhat more modern, having been planned for producer gas operation with a central gas producer supplying the whole line of kilns. However, the type of producer system adopted proved unsatisfactory so the kilns were later converted to direct firing by the addition of two fireboxes for manual firing similar to that described for the older kilns. These kilns had steel shells 10 ft. in diameter and 30 ft. high set on concrete foundations extending 11 ft. above the draw floor. There was some more cooling zone height available in these kilns, but the nature of any such direct-fired kiln prevented any real cooling except through radiation of heat at the cooler zone. True recuperation of sensible heat of the lime was impossible.

The original Dominion Lime Ltd. kilns, now abandoned, were a far cry from the present modernized set-up

All of the kilns depended on natural draft for their operation, and as a result of this and other factors common to such kilns, capacity was low, fuel requirements high, and labor per ton of output high. For the ten kilns, capacity averaged about 9 t.p.d. and the fuel ratio based on full coal equivalent was not more than about 3 to 1.

Kiln Modernization

Upon acceptance of the recommendations of the Azbe Corp., it was decided to proceed with the remodeling of three of the steel kilns. These were to operate with producer gas generated in Azbe integral producers, one for each kiln. The basis for the recommendations was a production of 25 t.p.d. of lime per kiln and a fuel ratio of 5 to 1, both of which were conservative as later results demonstrated.

Involved in the changeovers were provisions for storage of approximately 500 tons of kiln stone in a bin at the foot of a new charging incline, increase in height of the kiln shells to 56 ft., provisions for simple, semi-automatic charging of the kilns, complete relining of the shells to suit the Azbe center burner firing system, installation of suitable fans and ductwork to provide necessary draft and permit the use of recirculated gases in the kiln and producer system, necessary instrumentation and control features to assist the operators of the kilns, revision of the draw gate arrangement to permit selective variation of amounts drawn to suit conditions of the kilns, certain revisions of the building structure to provide adequate working areas, installation of the integral gas producers, and in-

*Azbe Corp., St. Louis, Mo.

Left: Former method of firing steel shell kilns. Right: Present method of firing steel shell kilns, showing gas producer and connection to kiln

stallation of a coal unloading and storage system to supply the producers.

With almost immediately noticeable excellent results from the operation of the three kilns in producing 30 t.p.d. at the projected 5 to 1 fuel ratio and more recently 40 t.p.d. at a 5.70 to 1 ratio, plans were then made for the remodeling of the fourth kiln for the burning of a smaller size stone than used in the first three kilns. It was found advisable to burn smaller stone to balance and use more completely the quarry output and to give all of the kilns a closer sized stone.

In the design of this kiln, because of the stone size, and from experience gained on the previous three kilns, rather important changes were made in the arrangements of kiln and producer. First, the kiln itself was arranged to be operated on the slip principle, rather than the "hang and trim" principle used so widely in this country. This does not necessarily connote continuous drawing, but does require frequent drawing if done intermittently. For this service, Jeffrey magnetic feeders were installed in place of the manually operated draw gates previously used.

The other principal change was in the use of a single fan to withdraw recirculated gases and to blow the gas producer as required, thus eliminating the use of one fan and insuring a steadier more controllable CO_2 content in the blast to the gas producer. This kiln has worked out exceptionally well with a daily capacity of 35 to 40 tons and a high fuel ratio.

Thus the four kilns remodeled to date have a capacity of about 160 t.p.d. at a fuel ratio of more than 5 to 1, with a lower labor cost than when hand fired, and also with no decrease in product quality.

At the present time, the fifth kiln is being made ready for operation on a combination of principles developed in the experience gained in the first four kilns. Stone will be of large size, draw will be with magnetic feeders on a frequent cycle to provide slip operation of the kiln, the producer blast will be supplied by the recirculation fan, a submerged offtake will be used to provide an auxiliary gas offtake and a lower active height of the kiln, and basic brick will be used in certain critical hot zone sections to insure free movement of the charge.

It is felt that all these kilns are eventual 50 t.p.d. producers at a fuel ratio of 6 to 1 which will make them the most capacious vertical kilns in operation today considering their small diameter. It is a credit to the foresight of the management of the company for realizing the potentials of these kilns and for providing the capital and engineering assistance necessary to bring about an increase from 9 to 40 t.p.d. of equal or better quality than before, and at a cost per ton far below that experienced previously.

Plant Operation

Following is a general flow description for the plant and quarry.

At the quarry, a 500-c.f.m. Ingersoll-Rand compressor furnishes all air for primary and secondary drilling. The drilling is done with Sullivan L-57 jackhammers with 1-in. hex steel and Liddicoat detachable bits. There is considerable secondary blasting done to reduce the primary stone size to that which can be handled by a ¾-cu. yd. Dominion No. 375 shovel. All blasting is done with 40 percent ammonia dynamite and about 6 tons of stone are broken per lb. of dynamite.

The Dominion shovel loads to two Dodge trucks carrying 12-ton payloads over a 1.2 mile round trip haul to the primary crushing and screening plant near the kiln plant. In addition to the equipment noted, a D-4 Traxcavator is used at the quarry for stripping and cleanup work.

The labor required to operate the quarry consists of three men doing all the primary and secondary drilling and blasting, one shovel operator who acts as quarry lead man, two truck drivers, one compressor operator, and one Traxcavator operator.

At the primary crusher station located high above the kiln plant, the stone is dumped into a hopper from which it is fed by a 36-in. x 6-ft. drag feeder to a 30- x 36-in. Traylor Bulldog jaw crusher. Discharge from the crusher is fed to a 30-in. belt by a Jeffrey 30- x 42-in. magnetic feeder. From the belt the crusher-run material passes over a 4- x 8-ft. Dillon screen with 1¼-sq. in. mesh cloth. The minus 1¼-in. material is discharged to a 16-in. belt which carries these fines to the stockpile serving the "Agstone" plant.

The plus 1¼-in. stone passes over another 30-in. belt to another 4- x 8-ft. Dillon screen where a separation is made at 2¼ in. The small fraction goes to a 500-ton storage bin for supplying the No. 4 "small" stone kiln and about 500 tons of the larger fraction is stored separately. It is felt that a "small" size stone would have an approximate volume in the range of 2 to 20 cu. in., while "large" stone would range from 20 to 200 cu. in. in volume.

At the outlet of each bin is a Jeffrey magnetic feeder with a No. 4 M.C. power unit, a 30- x 42-in. deck and an 18-in. grizzly section at the discharge end. The grizzly section under the small stone bin is spaced to

pass any minus ⅜-in. material while the grizzly under the large stone bin is set to pass any minus 1¼-in. material that has been produced in handling between the crusher and the discharge feeders.

The foot of the charging incline is centered under the small stone bin and the large stone is carried to this point by a belt conveyor when loading the kiln charging car. The latter is a side-dump skip carrying about 2 tons of stone per trip up a structural steel incline to the kiln top where it is automatically discharged as the kiln top door is opened by the travel of the car.

Only two men are required at the crushing and screening plant at the top of the stone bins.

Magnetic feeders for drawing kiln for burning small stone

Gas connection to kiln for burning small stone

Kiln Operation

The basic dimensions of the kilns have been noted previously. In their operation on the large stone, they are charged after each draw as is dictated by the fall of the stone in the top of the kilns. In the small stone kiln, because of the small size, a lower active kiln height is provided by a submerged offtake pipe and as a result a storage zone is provided in the remainder of the height necessary to maintain a level top track for charging the kilns. Only two fans are being used on each kiln. The exhaust fan is connected to a special exhaust gas temperature equalizing offtake system tending to increase over-all exhaust fan capacity. The recirculation fan serves to provide hot air blast recirculation through the integral gas producer.

The large stone kilns are drawn several times per shift through manually operated quadrant-type gates, the lime falling directly on the draw floor beneath the kiln. On the small stone kiln, four 18- x 30-in. Jeffrey magnetic feeders are used as draw gates and they are operated frequently for short periods to approach a continuous draw. Automatic timing equipment is now being installed on this kiln to eliminate the possible variations in cycle time and length of operating time that do occur with manual switching. It has been found important to maintain these as uniform as is practical for successful operation of the kiln.

Once the lime is on the floor, a TL-B Tracto-Loader is used with a front end bucket carrying 800 lb. of lime per trip to move the lime from beneath the kiln and either stockpile it on other floor areas, or load it directly to cars, or to place it in a large steel hopper for further processing.

Up to this point, the kiln labor required for operating four kilns is as follows: one kiln runner, one kiln fireman and four helpers per shift. The latter four men do the stone charging, assist in trimming the large stone kilns, draw the kilns, sort the lime on the floor if necessary, and operate the gas producers as necessary. The latter includes supplying coal and removing ashes from the producers. It appears quite possible for the same crew that operates four kilns to handle the fifth kiln when that is ready for operation.

Final Processing

The 1951 production was at the rate of 60,000 tons per year. The 1952 production is estimated to be at the rate of 80,000 tons per year. This is from kilns which were rated at only 15,000 tons per year, an increase of more than five times previous capacity. The normal operating labor force for this entire production based on quicklime loaded in cars, inclusive of quarry labor, of stone preparation, kiln operation and lime loading embraces only 35 men, or about 6 tons of lime per man per day.

From the steel hopper noted above, the lime can be routed to a Sturtevant No. 1½ rotary crusher or to an Acme 10- x 20-in. jaw crusher depending on the type of crushing to be done. A bucket elevator removes the discharge from either crusher and discharges either to a screw conveyor and chute arrangement for bulk loading or to a storage bin for further processing.

From the bin, the crushed lime can be sent to any of three points: to a packer for bagging "Spredmor" crushed lime, to a mixer where waterproof "Rock City" lime is prepared, or to a Clyde batch hydrator.

The hydrator is used for preparation of conventional hydrated lime which goes through a whizzer equipped Raymond automatic pulverizer system, or for the preparation of "Adhesive" lime which is passed through a Hardinge ball mill for grinding prior to bagging.

Shipment of all products is made by both railroad cars and trucks. The company operates its own branch line railroad between Lime Ridge and the main line of the Quebec Central railroad.

The processing department outlined above uses an average crew of seven men on one shift only for preparing, sacking and loading its output. The plant maintenance and repair work is handled by three plant men plus a construction crew that varies from six to 12 men dependent on the volume of new work being undertaken.

The officers and management of the new Dominion Lime Ltd. are: F. R. Graham, Jr., president; T. L. Dunbar, vice-president; C. N. Knowles, secretary-treasurer; J. A. Stewart, managing director; T. A. Rourke, plant manager; and Richard Thornloe, plant superintendent.

PENNSYLVANIA STONE PRODUCERS DISCUSS HIGHWAY AGGREGATE REQUIREMENTS

THE PENNSYLVANIA STONE Producers Association annual business and general meeting, held January 9 at Harrisburg, Penn., was highlighted by a record attendance of producers and guests.

New officers unanimously elected for 1952 included: Paul I. Detwiler, president, succeeding T. C. McPoyle; Robert Garman, vice-president; H. M. Binkley, treasurer; and Walter Fehr, secretary. Board members elected were: Adam Eidemiller, F. I. Narehood, Lewis M. Nauss, J. P. Peacock, J. C. Showalter and Paul Walker. Mr. Detwiler named Mr. McPoyle and Mr. Binkley as members of the executive committee.

O. M. Graves made a detailed report on the slag versus stone situation. His committee has been active for more than eight years, during which time numerous contacts were made with the Pennsylvania Department of Highways and other officials. During these conferences the results of exhaustive tests were presented to these officials which indicated the "unfounded" basis for the imposition of the 13 percent differential in favor of slag. He stated that a letter from the late secretary of highways, Ray Smock, addressed to the attorney general of Pennsylvania, requesting an opinion on this important subject, finally brought action. On October 25, 1950, the attorney general issued Informal Opinion No. 1466, advising the secretary of highways that purchasing aggregates on an average 13 percent differential was "not in accordance with the law relative to competitive bidding and the practice should be discontinued."

Paul I. Detwiler, newly elected president of Pennsylvania Stone Producers Association

The result of this opinion led the slag interests to contest the highway department's new method of purchasing, that is, on a ton for ton basis, by filing a bill of complaint in the Dauphin County Court.

Mr. Graves told the producers that the slag interests presented a well-prepared case, and that the stone producers, who acted as an intervening interest in behalf of the secretary of highways and the secretary of property and supplies, presented convincing evidence supporting the attorney general's opinion. To date, no decision has been handed down by the court in this case.

H. H. Wagner, general manager of the association, in his report, indicated that the Pennsylvania Stone Producers Association represents more than 90 percent of all the commercial crushed stone plants in Pennsylvania. The tonnage of commercial stone produced for 1951 represented the largest production in the history of the industry. He commented on the percentage depletion provision of the Federal Revenue Act of 1951, which applies to crushed stone to the extent of 5 percent. In the case of calcium carbonates and magnesium carbonates 10 percent is deductible, and in the case of chemical grade limestone and metallurgical grade limestone, 15 percent. The full text of the pertinent provisions are contained in Section 114(b) of the Internal Revenue Code as amended by Section 319 of the Revenue Act of 1951. This amendment applies to the taxable years beginning after December 31, 1950.

General Session

Past president T. C. McPoyle presided over the general session to which all members of the aggregates industry were invited.

E. L. Schmidt, acting secretary of

Left: Gathered in front of the speaker's platform are, left to right, R. G. Kline, Harold R. Kline Quarry, Wrightsville, Penn.; Ralph Binkley, Binkley Bros., Hoffsville, Penn.; Stuart Wise, L. B. Smith, Inc., Camp Hill, Penn.; J. W. Heisey, Heisey Bros. Quarries, Kheems, Penn.; Jake Bell, Stewart Equipment Co., Harrisburg, Penn.; Ralph Dano, Barber-Greene Co., Washington, D. C.; and Gordon Whitney, also of Barber-Greene. Right: (left to right) C. H. Beachum, General Crushed Stone Co., Philadelphia, Penn.; A. J. Bedard, Pennsylvania Department of Highways; C. L. Weaver, John T. Dyer Quarry Co., Birdsboro, Penn; F. J. Pollack and C. A. Reid, also of General Crushed Stone Co.

Left: T. C. McPoyle, left, retiring president of the Pennsylvania Stone Producers Association, John T. Dyer Quarry Co., Birdsboro, Penn., poses with one of the speakers, C. H. Buckius, assistant chief engineer, Pennsylvania Department of Highways, Harrisburg, and H. H. Wagner, right, general manager of the association. Right: (l. to r.) W. A. Warrick, chief construction engineer, Pennsylvania highway department, gets together with Nick Cascetti, Stowe Trap Rock Co., Oreland, Penn.; and Edward R. Boate, Bacon-Pietsch Co., New York, N. Y.

the Pennsylvania Department of Highways, in his opening address, expressed the gratitude of the department for the fine cooperation of the industry during the busy 1951 construction year.

C. H. Buckius, assistant chief engineer, department of highways, presented the estimated quantities of materials which will be required for the 1952 program. These requirements are as follows: 1,628,735 tons of bituminous concrete; 2,674,572 bbl. of cement; 1,626,971 tons of sand; 150,283 tons of reinforcing steel; 61,895 tons of structural steel and 50,894,519 gal. of bituminous material. The total of all sizes of coarse aggregates is 10,553,666 tons. These estimated requirements for 1952 equal the 1951 purchases in most cases, and in some cases exceed them.

Mr. Buckius pointed out that lack of structural steel was greatly hampering the department's bridge construction program, and that the Defense Materials Order, limiting highway construction to a two-lane pavement and restricting construction of four-lane pavements, was unreasonable.

W. A. Warrick, chief construction engineer, made a brief comparison of the types of highway pavements which were being built today compared to pavements of the late 1920's and early 1930's.

Compliments Industry

W. H. Herman, chief research engineer of the department of highways, complimented the aggregates industries for the fine quality of materials delivered during the past year. He remarked that there were 350 sources in Pennsylvania from which aggregates for highway work can be produced.

"Your plant expansions and modernization have made it possible for us to carry out our large maintenance and construction programs with a minimum of delay," he said.

Regarding bituminous construction he said, "You will recall that about two years ago a procedure was set up which required that the constructor or the material producer be responsible for the design of the bituminous concrete pavement or the material which goes into the pavement. I believe that we have accomplished more in quality of bituminous concrete since this requirement went into effect two years ago, than we had accomplished in the previous ten years."

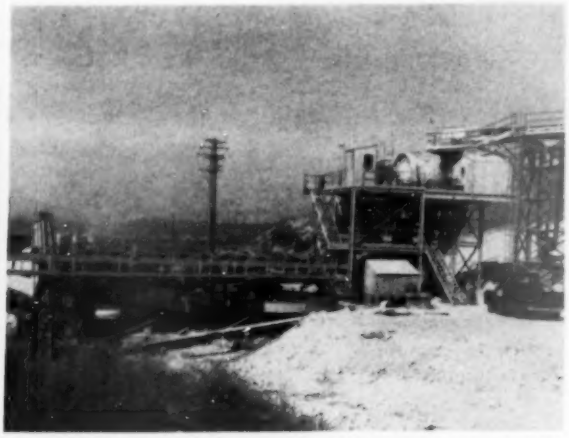
H. Hershey Miller, engineering director of the Pennsylvania Sand and Gravel Association, advised the highway department that even though there had been no rejections during 1951, the industry still had a large improvement program underway to produce an even better quality of aggregates than has been produced in the past.

A. E. O'Brien, executive secretary of the Associated Pennsylvania Constructors, called the attention of the group to a new regulation which will be issued by the department of highways, requiring that contractors be responsible for setting up and designing their own concrete mixes. He urged aggregates producers to cooperate to the fullest extent with these contractors so that they may be able to carry out the regulation so that they can produce the highest type of highway pavement.

After the luncheon, E. B. Romig, field manager of the Federal Social Security Administration, showed a film on "Social Security in Operation" which he followed with a question and answer period on the operation of the present Social Security Act. He pointed out that most self-employed people now come under social security if they work for themselves at their own trade or business and earn $400 or more in a year. Self-employed farmers and persons engaged professional-

(Continued on page 155)

Included among the banquet guests were: J. A. Savage, Mausdale Quarry Co., Danville, Penn.; Ed Jones, Narehood Bros., Milton, Penn.; Lewis M. Nauss, newly elected director, The Carbon Limestone Co., Lewellville, Ohio; Ralph E. Towers and Allen E. Harpold, The Bessemer Limestone and Cement Co., Youngstown, Ohio



Left: Primary crushing plant at the quarry of Kaiser Aluminum and Chemical Corp.'s Natividad, Calif., operation. The minus ¾-in. material is wasted at the pit from the screen plant in the foreground. Right: Plus ¾-in. stone is delivered from the primary screening plant to the scrubber, right, and then over a double-deck screen below the scrubber. The fines from the screen are handled by the bowl classifier in the center

Quarrying and Processing Dolomite

Kaiser Aluminum and Chemical Corp.'s dolomite plant at Natividad, Calif., supplies source material for magnesia products

KAISER ALUMINUM AND CHEMICAL CORP., at its Natividad plant near Salinas, Calif., operates an 8000 ton per 15-hr. day dolomite quarry. The final quarry product after beneficiation is a high grade calcium-magnesium carbonate rock and is the source material for the company's products at Natividad. These are calcined dolomite, high magnesia limes, deadburned dolomite and various sized raw dolomitic rock products. Some of the main uses of these products are:

1. *Calcined dolomite*—Kaiser Aluminum & Chemical seawater MgO plant at Moss Landing and Kaiser Magnesium Co.'s metallic magnesium plant at Manteca, Calif.
2. *High magnesia limes*—Used in paper pulp plants, putty plants for plaster and mortars and in fertilizers as a ground conditioner.
3. *Deadburned dolomite*—Used as a maintenance refractory material in open hearth furnaces in Western steel plants.
4. *Raw dolomite*—Used as roofing stone, as fertilizer filler, as steel plant open hearth maintenance material and for filtration beds in chemical plants.

The quarry at Natividad is located on the upper levels of the eastern foothills bordering the Salinas Valley. The deposit consists of large blocks of dolomite segmented by granite dykes and intrusions. Also, within the large blocks themselves there are veins of siliceous oxides other than calcium and magnesium which must be separated from the rock to produce the required grade material for subsequent products.

The quarrying procedure consists of drilling, using rotary rigs that will drill a 9-in. hole to depths varying up to 85 ft., followed by blasting, using granular 40 percent strength powder as the prime mover and Primacord with electric caps as the firing medium.

The broken rock is moved from the face with either a 2½-cu. yd. Marion electric shovel or a 4-cu. yd. Bucyrus-Erie electric shovel to 17-ton rock buggies and transported by them to the primary crusher or the waste dumps.

At the primary crusher (a 3- x 4-ft. Blake-type jaw) the rock is received in a concrete bunker, the bottom of which is equipped with a Sheridan grizzly. The fines by-pass the crusher while the coarse material is fed through it and is reduced to minus 5 in. in one dimension.

The crushed material then goes to the primary screen tower which eliminates the minus ¾- or minus ½-in. material (depending on the weather) that contains most of the granitic impurities. From here the rejects are conveyed by a 24-in. belt conveyor 625 ft. to the waste dump. The plus ¾-in. stone is conveyed 3619 ft. to the stone scrubber by a 30-in. belt conveyor.

The stone scrubber is a 10-ft. Hardinge scrubber with a 2½-in. round-hole trommel screen on the outboard end. The plus 2½-in. material goes to the offbearing belt and the minus 2½-in. material goes over a 5- x 10-ft. double-deck Ty-Rock F-600 screen. This screen removes the fines produced in the scrubber and allows for a separation to be made on either ½ in. or 3/16 in., depending on the quality of this fraction.

At present the product from the scrubber goes by a 30-in. belt conveyor a distance of 1515 ft. to the stockpile for storage. However, upon completion of the heavy-media separation plant which is now under construction, the product from the scrubber will go to the heavy-media plant and then to the plant stockpile.

The Natividad plant is one of three closely integrated Kaiser Aluminum and Chemical Corp. plants in the Salinas, Monterey Bay area. The other two are the seawater MgO plant at Moss Landing, which receives part of its raw material (calcined dolomite) from the Natividad plant, and the refractories plant (also at Moss Landing) which receives part of its raw material from the seawater MgO plant. J. F. Knight is works manager of the Chemical Division of Kaiser Aluminum and Chemical Corp. in California, with offices at Permanente, Calif. D. M. Kerr is general superintendent of the Salinas, Monterey Bay area plants. J. D. Moore is plant superintendent and H. L. Bolan is production supervisor at Natividad.

Grinding Circuits Applicable to Cement and Aggregate Industries

By E. J. KLOVERS*

SINCE THE TYPE of circuit in which a grinding mill is to be used defines, limits or divides the work to be done, an understanding of the various types of circuits, their merits and deficiencies, is helpful in determining the correct application of any individual grinding mill.

Grinding circuits can be broadly classified into wet and dry types, either single stage or multistage. The single stage circuit is the logical choice where capital outlay must be kept to a minimum, where the process is shortlived, where the cost must be amortized quickly, or often where a circuit change is anticipated in a later expansion.

The alternative arrangement is the multistage circuit which is more efficient but which requires auxiliary and supplementary equipment. This more efficient circuit produces at a lower operating cost, but to realize this saving it is necessary to make a substantially greater capital investment. Most operators insist that this investment be amortized within five years.

Wet and Dry Grinding

Cement clinker and many chemicals will undergo undesirable chemical and/or physical transformation if exposed to water and must be ground dry. Cement raw materials, however, may be ground wet or dry depending on the subsequent processing steps. The unit processes of wet or dry grinding each have advantages which hold true irrespective of the material being ground.

Where dry grinding is employed, grinding media and liner wear is lower. Also, when considering raw cement mix only, the dry mix requires less heat to form a clinker within the kiln, as compared to wet slurry. This difference in heat requirement usually amounts to 10 or 15 percent. In addition to this saving, dry process plants do not require filters or thickeners to reduce the water content of the kiln feed. Many wet process cement plants use an insufficient amount of water on classifying screens (primary mills only) preferring to operate with inefficient size separation rather than add expensive thickening equipment.

*Processing Machinery Department, Allis-Chalmers Manufacturing Co., Milwaukee, Wis.

The wet grinding process is inherently more efficient in the use of power. Materials ground dry require considerably greater expenditure of energy than with wet grinding. Test figures frequently vary between 10 and 30 percent—sometimes as high as 100 percent.

Dust, which causes excessive wear and which makes dust seals and dust collectors necessary, is unknown to the wet circuit. In a dry circuit, the dust collector represents a large part of the capital and operating costs.

Working conditions are invariably better if wet grinding circuits are used. This factor assumes importance whenever the labor market becomes tight. Use of the wet process makes it possible for materials to be pumped. This is cheaper and simpler than using elevating and conveying equipment. Wet materials are also easier to mix. While the wet process in which raw materials are ground to a slurry for kiln feed has been predominant for the past two decades, particularly because of the close control exercised over the blending of the kiln feed, steadily increasing cost of fuel in some regions has stimulated renewed interest in the dry process.

Open Circuit

The simplest of all circuits, which may be operated wet or dry, is the single-stage, open circuit (Fig. 1). Feed, sized at about ½ in. is introduced at a rate which permits the product to stay in the mill sufficiently long to be ground to the required fineness. The product may vary between 80 and 95 percent passing 200 mesh.

The grid division head shown within the mill in Fig. 1 is an annular ring of tool steel bars with a space between the bars. This space can be varied between 1/16 and ⅜ in. Material cannot leave the first compartment until ground sufficiently fine to pass through the openings between the bars. The grid division head is the only means of minimizing objectionable amounts of oversize in an open circuit mill when grinding to a specified percentage passing 200 mesh. The open circuit and the grid division head are of little use today in the cement industry, but are used in the reduction of such chemicals as calcium carbide. This chemical must be ground in an atmosphere of nitrogen, which makes closed circuit grinding in conjunction with an air separator impractical.

Classifiers in Grinding

In an effort to lower the power consumption per unit of product, classifying devices have been adopted. A classifier in closed circuit with a wet mill grinding cement raw materials eliminates objectionable oversize from the kiln feed and reduces the amount of extremely fine particles which serve no particular advantage in the kiln feed.

An air separator can be used the same way in closed circuit with a short mill dry grinding cement raw materials. Different advantages are gained by circuits having an air separator in conjunction with a long mill dry grinding cement clinker. The closed circuit eliminates objectionable

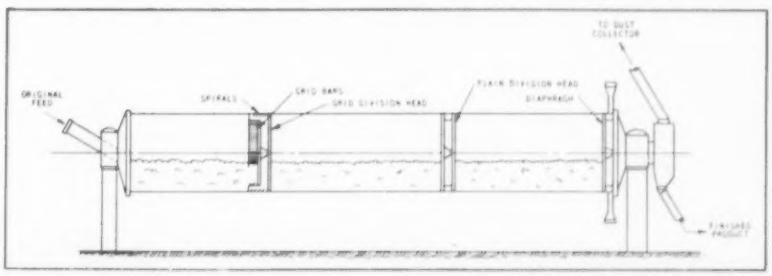


Fig. 1: Single-stage open circuit for wet or dry grinding. In a cement plant, the usual feed size for this type is approximately ½ in. and the product varies between 80 and 90 percent passing a 200-mesh sieve

oversize in the product and it allows the high percentage of fines which give cement its quick setting properties, but it also frees the mill of ultrafines which coat the balls and lower the efficiency.

A size analysis was made of progressive layers of finely ground cement clinker coating on small grinding balls. The outermost layer had a size range close to that of the product of the mill discharge. Each layer inward was composed of progressively finer material and the layer adjacent to the skin of the ball consisted of particles as fine as three microns (0.00012 in.). Removal of these ultrafines reduces ball coating, improves efficiency and contributes to higher capacities.

Single-Stage Closed-Circuit Mill

The wet, single-stage, closed-circuit mill (Fig. 2) is materially shorter than the single-stage, open-circuit unit. As a result, the retention time for any individual particle during one pass through the mill is reduced. This means that the mill does some grinding on each size range of the material. The discharge is put into a classifier which separates the fine from the coarse and returns the coarse fraction to the mill for a second pass. Conceivably, an extremely hard piece of limestone can make 100 round trips through the mill and classifier, while a small fragment of marl will be discharged from the circuit at the required size after but one trip.

The oversize material from the classifier or air separator is called the circulating load and the ratio of the circulating load weight to new feed weight can be expressed as the percent circulating load. In a circuit of this type, the percent circulating load may vary between 200 and 600. On an average, each particle makes two to six round trips before being reduced to product size.

In a single-stage closed circuit for dry grinding (Fig. 3), the classifier is replaced with an air separator for removing dry product. This circuit as illustrated is suitable for producing kiln feed from approximately ½-in. cement raw materials.

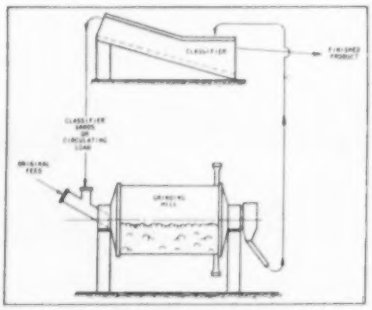


Fig. 2: Single-stage, closed circuit for wet grinding. This circuit is suitable for producing kiln feed from approximately ½-in. cement raw materials

Long Compartment Mill

In a fourth type of circuit (Fig. 4), the short mill is replaced with a relatively long two or three compartment mill. Although this circuit is almost identical with that shown in Fig. 3, the product from each would differ as well as the applications. The longer compartment mill increases the retention time for the material within the mill.

If we were to assume that the circuits in Fig. 3 and 4 grind to the same fineness—say 90 percent minus 200 mesh—the product from the mill in Fig. 4 will have a higher percentage of extremely fine particles. While these extreme fines represent a waste of energy for kiln feed, they are desirable in finished cement. Therefore, the Fig. 4 circuit may be considered as finding widest application for the finish grinding of cement clinker.

Recently, operators have shown an interest in grinding cement clinker in the circuit shown in Fig. 3. Test work has not been conclusive, but preliminary results indicate that this finished cement has a 28-day strength equal to or better than that produced in a circuit such as shown in Fig. 4. However, the one and seven day strengths are low, probably due to the lower percentage of ultrafines produced in the short mill.

Moisture Effect on Efficiency

The single-stage, closed circuit as shown in Fig. 5 is finding use in dry grinding of cement raw materials, river sand and aggregate refuse. The latter can be ground so as to pass a fine aggregate specification. However, if these materials are to be ground dry, they must be nearly bone dry—about 2 percent moisture or less—or a coating collects on the surface of the balls, cushioning the impact and greatly reducing grinding efficiency.

The critical moisture which promotes coating is not a constant. It varies according to the material and its fineness. Cement clinker presents no moisture problem, but cement raw materials can rarely be ground economically to kiln feed if the moisture exceeds 2 percent. Therefore, if a raw material contains the usual 5 percent moisture, it must be processed in a dryer before grinding.

The ball coating which collects when grinding moist materials is similar to that experienced when grinding dry materials in open circuit. However, the presence of moisture within a mill hastens the formation of a coating which will consist of relatively large particles. In either case, the coating materially decreases the mill efficiency.

Drying While Grinding

The circuit shown in Fig. 5 eliminates the dryer since the drying is done in the mill and air separator. The hot dry air introduced into the air separator has ideal access to the fine material. All particles are widely separated, and the air velocity materially reduces the film coefficient resisting the heat transfer. The finished product is thoroughly dry, facilitating dry blending, mixing and storage. The oversize from the air separator

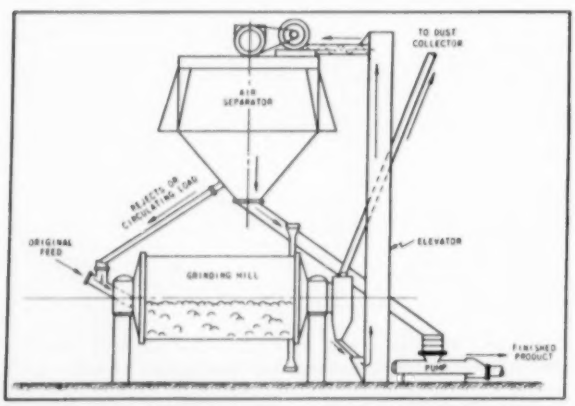


Fig. 3: More elaborate single-stage, closed circuit for dry grinding. Air separator is used instead of classifier as in Fig. 2

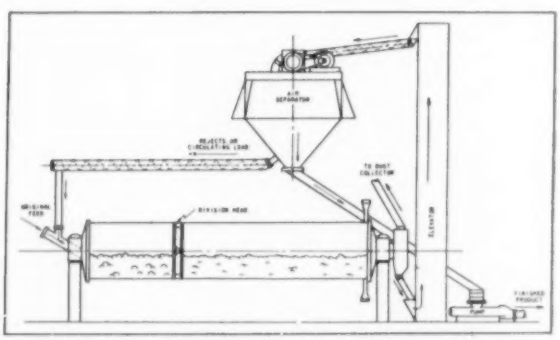


Fig. 4: Single-stage, closed circuit with "Compeb" mill. This type will have higher percentage of extremely fine particles than circuit in Fig. 3

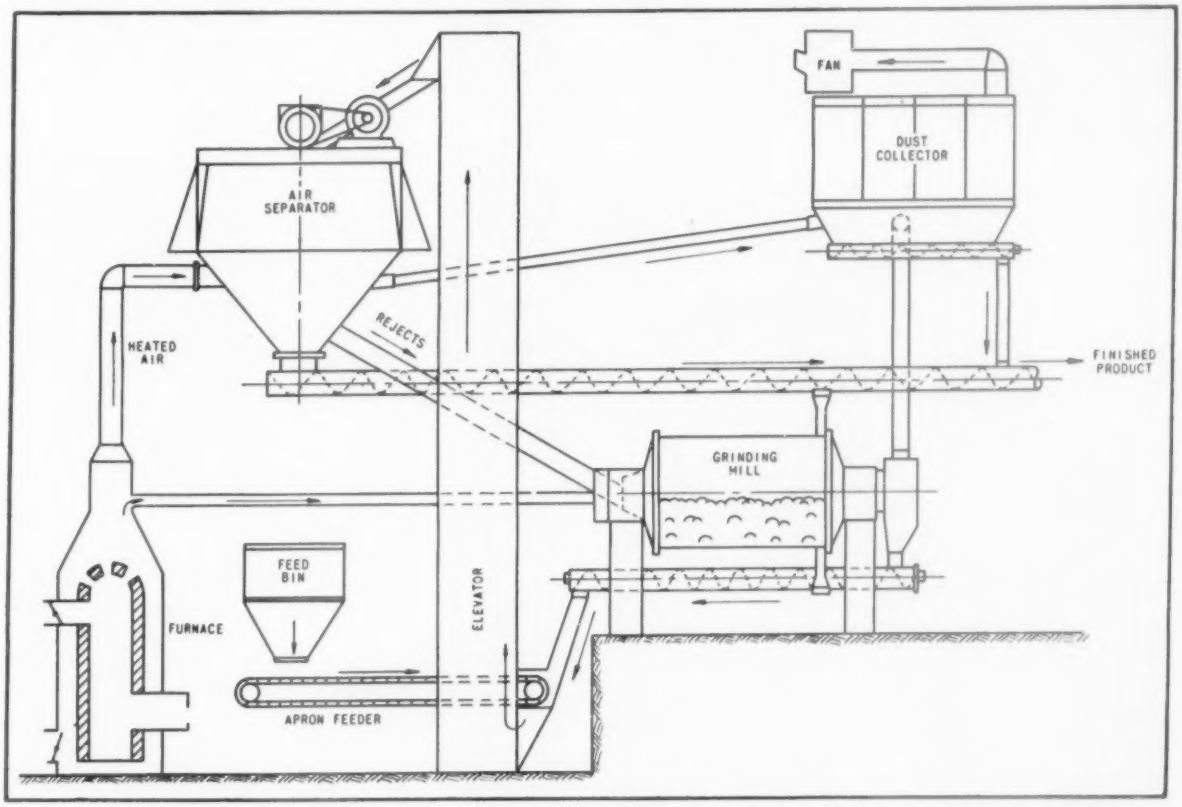


Fig. 5: Single-stage, closed circuit for dry grinding of moist materials where a preceding dryer is not thought practical

is sufficiently dry to lower the overall moisture content of the material within the mill when combined with the original feed.

When manufacturing fine aggregate, the circuit in Fig. 5 is not usually employed to grind all of the aggregate. Instead a fraction is ground and blended with one to five parts of the original feed. The grind and the blend ratio are dependent on the screen analyses of the initial and of the desired fine aggregate. Natural fine aggregate having a deficiency of fines is often treated in this manner.

Rod Mill Circuits

Other single-stage circuits for the manufacture of fine aggregate employ rod mills. Rod mills are most suitable for coarse grinding where the final product is to be No. 4 mesh or somewhat finer. In the rod mill, the rods are held apart throughout their length by the coarsest particles present in that section of the mill. In action, the rod mill can be compared to multiple crushing rolls and any two adjacent rods are similar to crushing rolls having a definite operating gap. Rods are selective grinding bodies, reducing the coarsest material. Balls, on the other hand, may be in surface contact through small contact areas. They do not utilize an operating gap and therefore are better suited for fine grinding. The rod mill is popular because of its ability to deliver a product with little tramp oversize, thereby eliminating closed circuiting with a screen or classifier.

The simplest rod mill circuit is the wet-grinding, single-stage circuit shown in Fig. 6. The product of this circuit will contain approximately 80 percent solids. However, when water is undesirable to a subsequent process, the product must be dewatered in a classifier, a dewatering drag, thickener, or most often in a settling pond. Reclaimed water may be returned to the circuit.

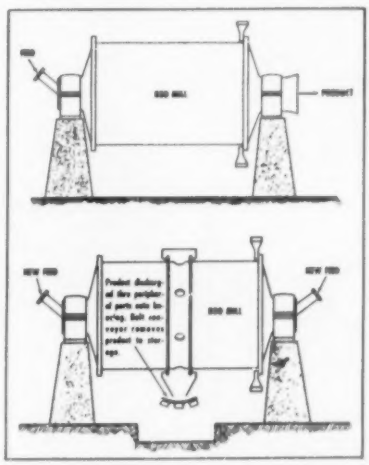


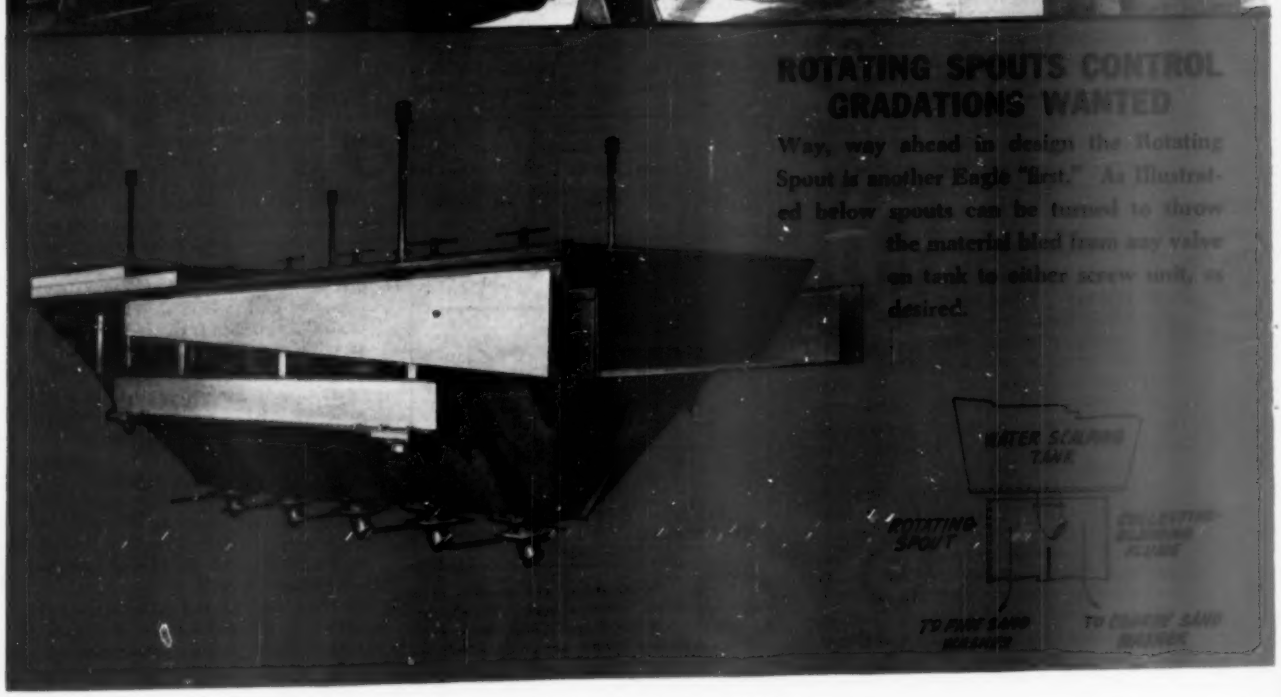
Fig. 6 (top): Single-stage, wet-grinding open circuit employing overflow type rod mill. Fig. 7 (bottom): Single-stage, dry-grinding open circuit employing center peripheral discharge type rod mill

Because of the nuisance and cost involved in dewatering, it is usually desirable to grind dry. The overflow rod mill cannot be used for this application but a peripheral discharge type has been developed to provide a material gradient within the mill. This gradient establishes a flow which in turn allows control over continuous grinding. Mills with end peripheral discharge openings are fed from the opposite end, while mills with center peripheral discharge are fed equally at both ends.

A typical single-stage dry-grinding open circuit for production of fine aggregate is shown in Fig. 7. This circuit can be altered for wet grinding by substituting a pipe or launder for the conveyor. The end peripheral discharge rod mill is often employed for dry or wet grinding when a somewhat finer product is desired as compared to the product of the center peripheral discharge rod mill.

Often no tramp oversize is permitted in the product of a circuit employing a rod mill, either wet or dry grinding. While open circuit rod mills

IT'S "IN THE BAG"



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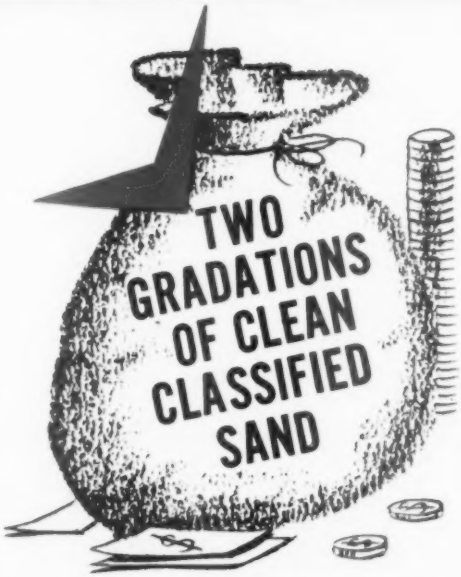
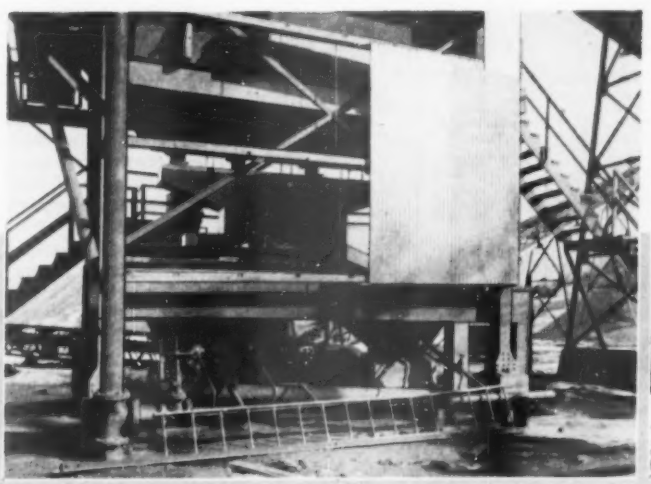


STANDARD SLAG CO., Youngstown, Ohio, operates several sand and gravel plants using Eagle Washer - Classifier - Dehydrators. But, they are justly proud — and so are we — of their Mantua, Ohio, plant shown here.

Wet screened fine material is fed to an Eagle Water Scalping Tank, equipped with automatic bleeding valves, which removes excess water, provides preliminary classification and retains desired volume of fines. Concentrated material is deposited in a dual collecting blending flume. Rotating spouts on bottom of scalping tank are adjusted so that coarse sand, which quickly precipitates at feed end, is spouted into one half of flume — fines which settle at far end are spouted to other half of flume — in desired proportion.

The coarser product is flumed to a 57" x 22' Eagle Double Screw unit where it is washed, further classified as desired and discharged onto conveyor dehydrated. The finer sand is flumed to a 29" x 22' single screw unit — two gradations of premium sand for a waiting market — an abundance of sand that meets the most rigid aggregate specifications! Send for the facts today!



Shown at left is tank, flume and feed end of screw units. Below: View of Standard Slag's plant. Output averages 110-ton per hour top grade material. Many successful Ohio operators use Eagle Fine and Coarse Material Washers, with Eagle Water Scalping Tanks as auxiliary equipment. Profit conscious operators are cashing in on Eagle's experience and "tell how."

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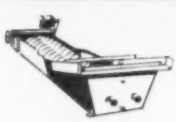
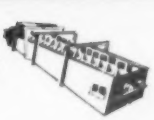

Screw Washers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produce little tramp oversize, a classifying device must be inserted in the circuit if the product is to be 100 percent passing a limiting coarse mesh size. This is often the case when ½-in. x 0 material, with a deficiency of material on the coarse screen size, is to be reduced to 100 percent passing 4 or 6 mesh, and where a large fraction of the material must be held on the coarse screen sizes. Such a closed circuit as applying to a wet-grinding overflow rod mill is shown in Fig. 8.

Either of the peripheral discharge rod mills can be closed circuited with a screen by using elevators or long conveyors to elevate the mill discharge.

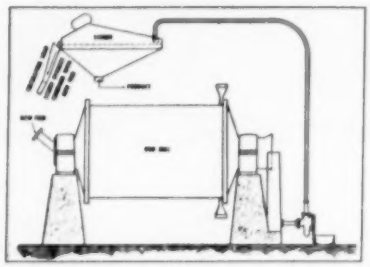

Fig. 8: Single-stage, wet-grinding closed circuit employing overflow type rod mill

Two-Stage Circuit

Continued large scale grinding of metallic ores has shown that a two-stage circuit can lower direct operating costs. The saving is due to up to 30 percent reduction in steel consumption and a capacity increase of up to 15 percent. Or, equal capacity can be realized with a power saving of up to 15 percent.

From these findings, and also from their own experimental work, many cement manufacturers have adopted the two-stage circuit and have utilized the circulating load more effectively to boost their production. Whether reducing to mesh size or to a specific surface area, grinding through two successive mills has these advantages: (1) Ball sizes can be matched to the material size. This allows maximum ball area for grinding without sacrificing ball mass required to break the largest pieces of the material. (2) Fines can be removed more rapidly. The preliminary mill is invariably short. This permits the fines to be passed quickly into the secondary mill. Coarse rejects are sent back to the preliminary mill where ball size is large enough to reduce them. (3) Speed of the primary mill can be maintained high enough to grind mainly by impact. Speed of the secondary mill can be low enough to grind mainly by attrition.

Many compartmented ball mills realize the advantage of using large balls on the largest feed, as stated in the first advantage above. Because of the difference in ball sizes on either side of the division head, circuits employing a single compartmented mill (Fig. 1 and 4) are often referred to as two-stage circuits. The author does not agree with this interpretation because all compartments are locked within a single shell, and there cannot be any regulation of mill speeds or any flexibility in controlling the paths of coarse or fine material.

A typical wet-grinding, two-stage circuit often used on cement raw materials is shown in Fig. 9. It can be modified slightly by substituting a 16 or 20 mesh screen for the rake classifier.

A dry-grinding, two-stage circuit used either for cement raw materials or clinker is shown in Fig. 10. Note that the mill proportions in Fig. 9 and 10 are the same. These circuits are popular since the first can be employed in the raw end, the second in the finish end, and all mills can be duplicates. Duplication reduces the amount of stock parts which should be kept for routine maintenance or emergency breakdown.

Actually the preliminary and secondary mills are not exact duplicates. The secondary has a smaller diameter pinion and therefore turns the mill slower. On smaller mills with V-belt drives, the sheave ratios are easily changed.

Purpose of the slower speed secondary mill is to run the mill at a lower percentage of critical speed which enables the balls to grind mainly by attrition—a crushing and shearing action.

As indicated in Fig. 10, rejects (oversize) from the air separator may be split between the preliminary and secondary mills. The usual procedure is to return all rejects to the preliminary mill.

A two-stage, dry-grinding circuit for cement raw materials or preferably for clinker is shown in Fig. 11. It is similar to Fig. 10, but note that the secondary mill is relatively long. The circuit in Fig. 11 is preferred by those operators who want a long secondary mill with its long retention time for production of extreme fines which give cement its quick bonding properties. This circuit is also used by plants which have operated a compartmented ball mill in a single-stage circuit with or without closed circuiting with an air separator. If production is to be increased, the addition of a primary mill is the means preferred by most operators. On the shorter com-

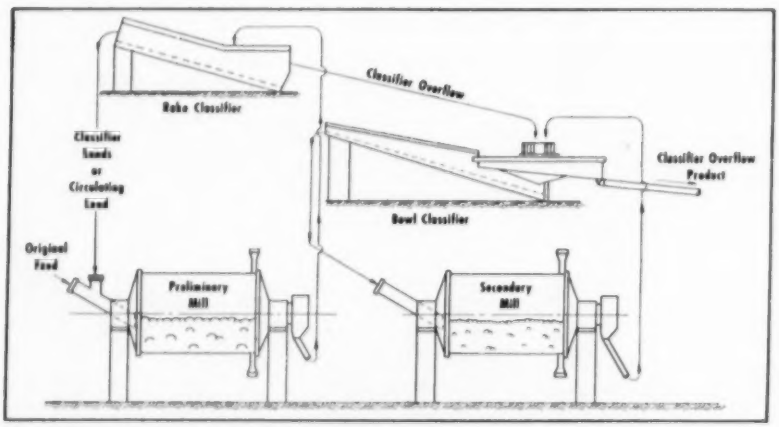

Fig. 9: Wet-grinding, two-stage circuit with duplicate mills. A fine mesh screen can be substituted for the rake classifier

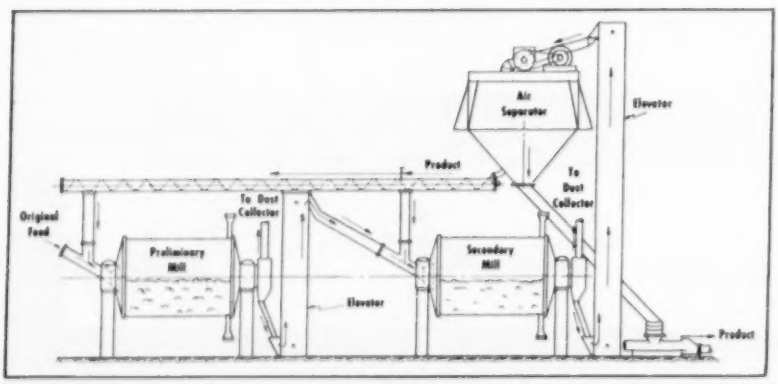

Fig. 10: Dry-grinding, two-stage circuit with duplicate mills. This type and Fig. 9 are popular since the wet type can be used in the raw end, the dry type on the finish end with all mills duplicates

ANNOUNCING! a New Metallurgical Tool

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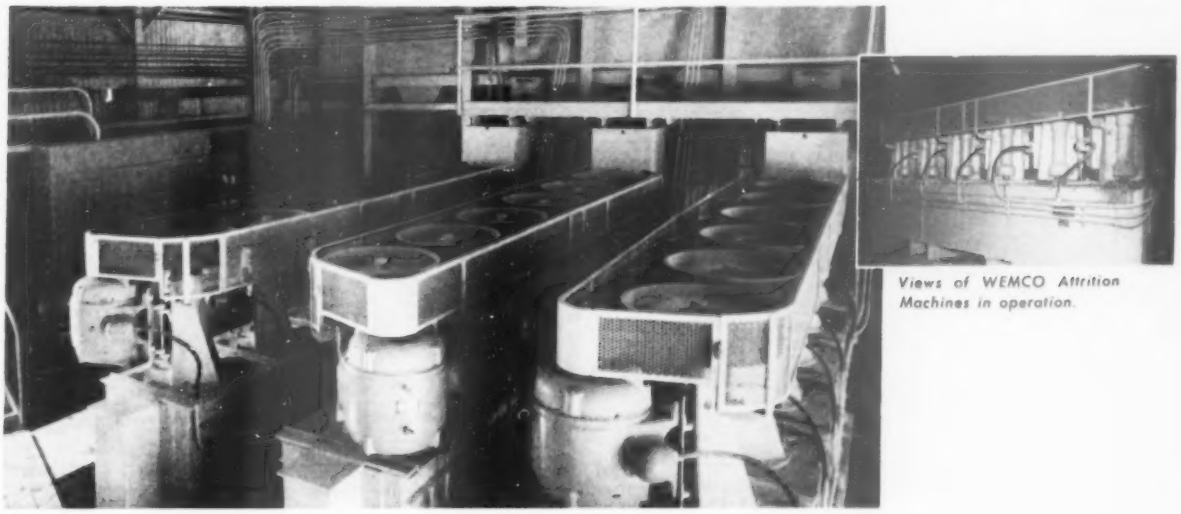

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- Elimination of slime coatings
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Ores or industrial minerals of this type may be separated, either the particles or the cementing material being recoverable for valuable mineral content.

PRINCIPLE OF OPERATION

By controlled turbulence of high density pulps, the WEMCO Attrition Machine thoroughly abrades mineral and ore particles. The imparted action is decidedly more efficient and complete than similar treatment previously attempted in grinding mills. Power consumption is greatly decreased, averaging 3½ to 7 kw. per ton of capacity. Maintenance and replacement costs are lowered to approximately 1 cent per ton of output.

PLANT OPERATIONS AND LABORATORY TESTING

Many months of actual plant operation and extensive laboratory programs have demonstrated the wide adaptability of the WEMCO Attrition Machine. Results obtained on a few of these ores are shown below:

- ***Tungsten ore*** — *Substantial improvement of flotation grade and recovery in the retreatment of former tailings.*
- ***Uranium ores*** — *Liberation of uranium minerals in the cementing material of sandstone.*
- ***Glass sand production*** — *Removal of iron oxide stain to meet market specifications.*
- ***Aggregate and sand production*** — *Disintegration of sand and clay cementing material from aggregate, saving both aggregate and sands for marketing.*
- ***Sulfide ores*** — *Removal of semi-oxidized coatings, making flotation separation possible.*
- ***Gold ores*** — *Greatly increased flotation recovery by removal of reagent and oxide coatings on former tailings.*

WRITE TODAY for further information pertaining to your problem. If desired, WEMCO's mineral testing laboratory is prepared to make attrition tests on samples of your ores and industrial minerals.

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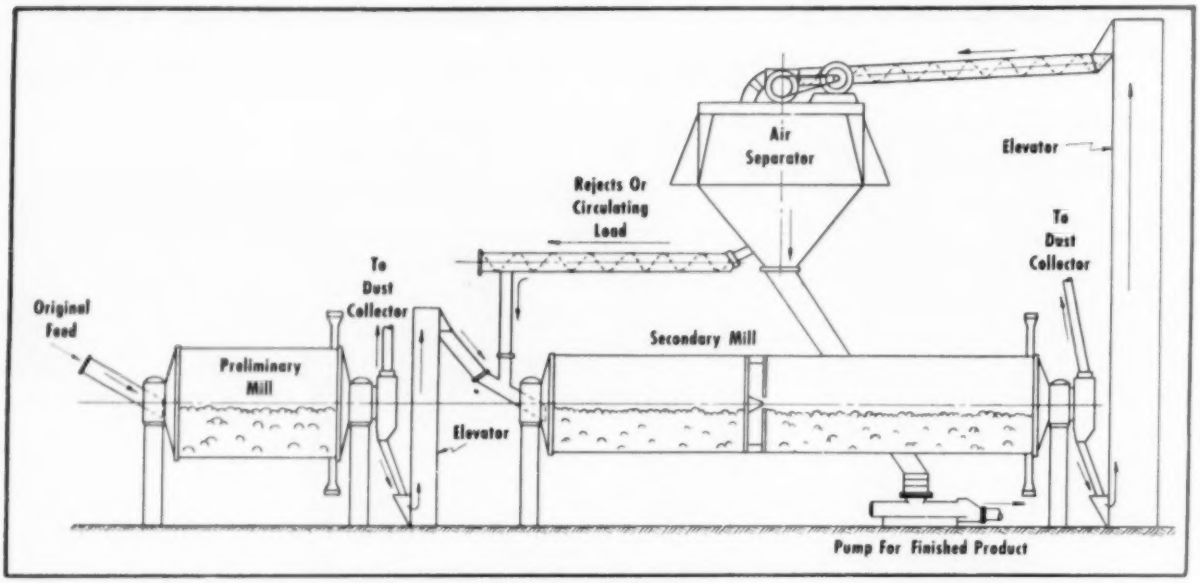

Fig. 11: Two-stage dry-grinding circuit with its long secondary mill is popular with operators who want longer retention time in the secondary mill

partmented mills, many operators removed the division head from the mill which is converted into a secondary mill. Their aim was to lower the metal wear and the maintenance on the secondary mill. Unless the mill is too long for a single gradient from feed to discharge end, the division head serves no purpose in the two-stage circuit. However, some operators leave the division head in their shorter secondary mills and use it to separate medium sized balls in the first compartment from small balls or "Concavex" in the second compartment.

Flexible Circuit

The Fig. 12 circuit is the most modern type and deserves consideration from any manufacturer who contemplates a new plant which will divide its production between standard and high early strength cements. All three mills are identical except for the higher speed pinion on No. 1 mill. The flow of material through the circuit when grinding clinker to standard cement (about 1750 specific surface) is shown with solid arrows. This is a two-stage circuit with the product from the first mill split between mills No. 2 and No. 3. When grinding to high early strength cement, the flow is as shown with the dotted arrows. This is a three-stage circuit in which all the product passes successively through all three mills and is discharged from the air separator of No. 3 mill.

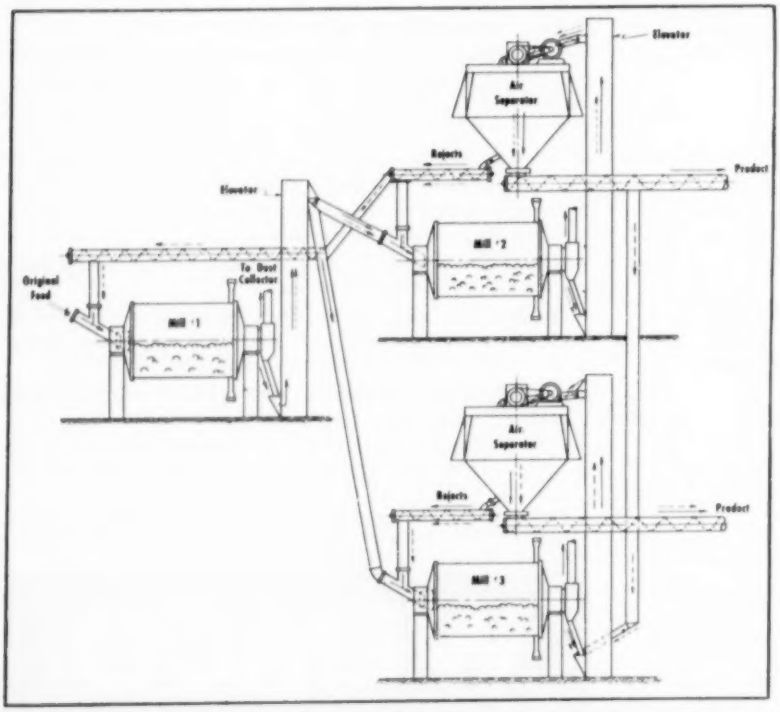

Fig. 12: Modern dry-grinding circuit for either two- or three-stage operation. This is ideal for production of either standard or high early strength cement. All three mills are identical except for higher speed pinion on No. 1 mill

Two-Stage Open Circuit

The grid division head shown in the single-stage circuit (Fig. 1) has the disadvantage of high construction and maintenance costs, but many operators prefer the open circuit mill since they believe it produces better cement. This is a matter of personal preference and experience. In any event, if the operator desires a two-stage circuit, with an open circuit type of grid, the circuit in Fig. 13 is the answer. What's more, the two stages of grinding are accomplished in a single mill.

Incoming feed is ground in the preliminary compartment with balls graded down from a maximum size of 4 in. The product passes through the division head and into the second compartment where reduction is effected with smaller balls. The product of the second compartment then passes through a modified division head and leaves the mill through peripheral ports in the shell. This product is conveyed to an air separator which is set for a product separation coarser than

(Continued on page 132)

Minerals Yearbook

THE BUREAU OF MINES recently announced the availability of the 1949 volume of the "Minerals Yearbook," a basic source of information on domestic and foreign mineral commodities. The bureau reports that this issue, containing complete data for the year 1949, as well as comparative data for earlier years, has been improved by new summary tables on domestic mineral production, resulting in uniformity of national-state output data. The new national totals pertain exclusively to the production from domestic operations, while in previous issues they included in some instances mineral products made in this country from imported raw materials, Also, the value of the U. S. mine output, as now constituted, is limited to the 48 states and the District of Columbia. The territories and island possessions now appear in separate tables.

The 1949 issue contains 1635 pages of text, plus a 26-page index. The commodity review, written by specialists in their respective fields, deals with metals, nonmetallic minerals and mineral fuels, which are based on information obtained from producers, processors and consumers of minerals; government agencies, scientific and professional journals and trade associations. A separate section deals exclusively with foreign minerals production.

Bound copies of the 1949 issue may be obtained only from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for $4.50 each. All of the chapters of the book have been printed as individual preprints which may be obtained for $0.05 to $0.30 each.

Certificates of Necessity

THE NATIONAL SAND AND GRAVEL Association recently issued to its members a memorandum dealing with applications for certificates of necessity. Many companies, after filing applications or after being issued the certificates of necessity, have found it necessary to make changes, additions and substitutions in facilities and revisions in cost estimates. The memorandum, prepared by the association's counsel, explains some of the steps which may have to be taken to make sure a company's interest is protected and that it will obtain the full benefit of amortization under the certificate.

Hydrated Lime Plant

MCCARTHY IMPROVEMENT CO., Linwood, Iowa, recently began production at its new $500,000 hydrated lime plant, the first such plant in Iowa. The plant is opposite the Linwood Stone Products Co. quarry, which is owned and operated by the McCarthy company and which will be the source of limestone to be processed at the new plant.

Air-starved tools get up and go with Jaeger "air plus" pressure

100 cfm more air, 40% more footage
With Jaeger's 600 ft. of 100 lb. air (which has made 500 ft. compressors obsolete) D. W. Winkelman Co. stepped up drilling speed 40% when shooting rock on the Pennsylvania Turnpike.
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To cut pipe tunnel at Marion, Ohio, George J. Igel & Co. needed 110 cfm at 100 psi to run their Ka-Mo drill. A Jaeger Model 125 did the job easily after a 105 ft. unit tried and failed.
3 guns instead of 2 (50% more work)
With the Jaeger 75 (instead of an "old standard" 60) Surface Coverings Co., San Antonio, Tex., works 3 spray guns instead of 2. Each gun uses 25 cfm of air.

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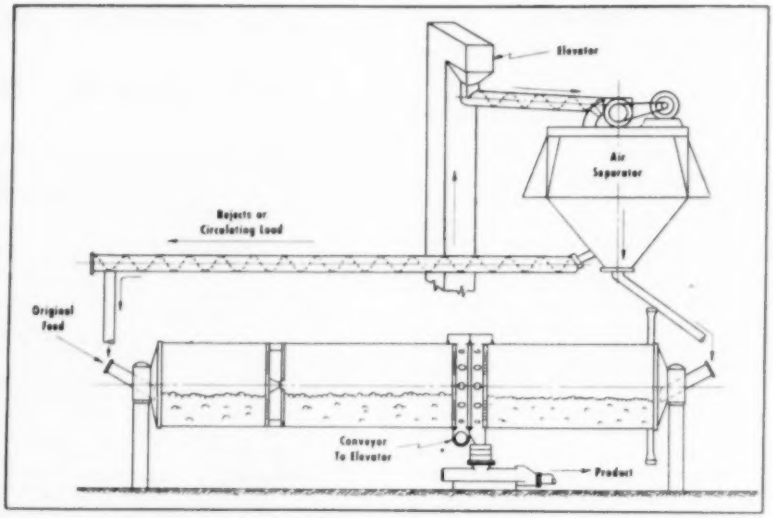

Fig. 13: This circuit is applicable for clinker grinding where the operator prefers the clinker ground in open circuit through the final stage

Grinding Circuits

(Continued from page 130)

desired of the finished product. The oversize is returned to combine with the original feed while the fines are spouted into the third compartment (at the gear end) to be ground in open circuit.

With minor modifications the 13 circuits just described, along with the variations mentioned, illustrate those circuits most popular in the stone products and mineral industries. Selection is based on the obvious factors of material, feed and product size, and the less tangible factors of labor quality, balance between capital investment and operating cost, experience and preference.

N.A.L.I. Convention

(Continued from page 93)

put of 25-50 t.p.h. based on a feed of minus 2-in. material, and a product 100 percent minus 20 mesh. These mills will handle material satisfactorily with moistures up to 4 or 5 percent but the feed of dry stone is preferred and is a more economical operation over-all. This was borne out by a producer who operates such mills both with and without supplementary dryers.

Mr. Lewis of Quaker Rubber Co. urged that producers anticipate their belting requirements in advance, in view of the fact that many make the most out of their belts and then expect rush deliveries for replacement. He commented on new designs of belts and particularly on the nylon cords which have excellent flexing properties.

Mr. Van Buren, also of Quaker, then commented on proper use of belting and detailed properties of the various classes of belting. Failures, he said, are usually due to accidental causes and he suggested that failures of the past be reviewed as a guide to a corrective course of action. He advocated the assignment of a man to supervision of belting whose duties would include routine inspection for cuts, breaks, edge wear, tension and alignment. Characteristics of the low, medium and high grades of belting were described.

Electrical vulcanizing in the field was mentioned as preferable to use of self-curing putties for repair. A splice, he said, is the weakest point in a belt and therefore must be carefully done for proper alignment. Loading from chutes should be done in the direction of travel of the belt and preferably at the same speed. Side loading, according to Mr. Van Buren, sets up side thrusts because of nonuniform load distribution. He does not believe in the use of skirt-boards and he suggested, if they must be used, that they should fan out so as not to catch pieces of stone. In selection, his suggestions were to standardize on belt sizes, buy sizes of sufficient capacity and which are not too thick in relation to the pulleys.

Among types of belts described were the neoprenes which are oil resistant and some of which are heat resistant, and nylon cottons which reduce the required thicknesses which is of advantage for long hauls and high lifts.

Entertainment

In addition to the regular sessions the program featured two luncheons, a cocktail party and buffet supper and the annual banquet. Top-ranking speakers were scheduled for these events.

John H. Riddle presided for a luncheon at which Dr. Tennyson Guyer presented an inspiring address entitled "That's the Spirit." Dr. Guyer has a powerful and humorous style and, in this address, he managed, very cleverly, to get across the essentials of liming to sound agriculture. The most important thing that he drove home, in our opinion, is that we

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must retain our optimism and sense of humor and values to overcome the obstacles that confront us.

Charles F. Brannan, Secretary of Agriculture, gave an address at the second luncheon at which Jack Diely was presiding officer. Secretary Brannan obviously has full appreciation of the value of agricultural limestone in an expanded program of agriculture. In view of increased demands for food here and abroad, he said that farm output in 1952 must be stepped up another 6 percent over 1951.

He touched upon the relation of food to world conditions and he expressed pleasure in the fact that the two former agricultural limestone associations have been merged.

Some 120 congressmen were guests of the industry at the annual reception and banquet at which president Robert Patton presided. "Bread, Butter and Baloney" was the title of an extremely humorous and informative address by David P. Livingston of Linlithgow Farm, Washington, Iowa.

Mrs. Alvin Armbrust and Mrs. Arthur Alvis again were co-chairmen for the ladies program which included special tours to public buildings and art galleries; also the industry luncheons and annual banquet.

Pennsylvania Producers

(Continued from page 121)

Congressman Richard N. Simpson gave a brief report on percentage depletion as it applied to the crushed stone and allied industries. William Hargadine, Jr., regional director, Wage and Hour Division, U. S. Department of Labor, discussed briefly Wage and Hour Regulations No. 5, 6 and 8. He pointed out that every employer should have a copy of these in his file, and that no wage or salary increases should be considered without the full knowledge of the requirements which covered his particular type of proposed wage increase.

Mr. Hargadine explained that General Wage Regulation No. 5 covers wage adjustments under the merit or length of service plan. General Wage Regulation No. 6 covers the 10 percent increase in wages to correct inequities arising because of disparities between increases in wages and salaries and the increase in cost of living since January 15, 1950. General Wage Regulation No. 8 covers the cost of living increase, even though they exceed the 10 percent allowed in Regulation No. 6.

All of the above increases may be granted without prior specific authorization of the Wage Stabilization Board. However the employer who makes such increases must keep available for inspection by the government such records as will show the method of calculating the increases.

The final speaker was D. L. Miller, construction engineer of the Pennsylvania Aeronautics Commission, who discussed proposed airport construction in Pennsylvania.

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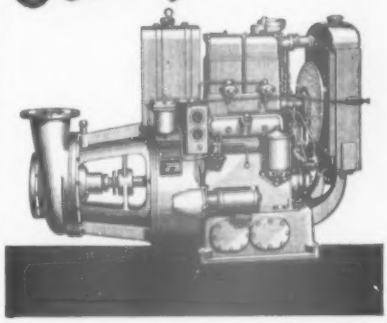

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• NORDBERG "4FS" Diesel Pumping Units are available in 1, 2 and 3-cylinder sizes, combining low cost, reliable power with efficient centrifugal pumps for practically all pumping jobs. Users report saving $100.00 a month over gasoline powered pumps. Capacities from 200 to 3200 gpm. at 20 to 220 ft. head.

Other Nordberg "4FS" Diesels are available as "packaged" generator sets, producing from 6 to 30 kilowatts . . . and as straight power units in sizes from 10 to 45 H.P. with stub shaft or clutch power take-off drives. For full details, mail the coupon now.

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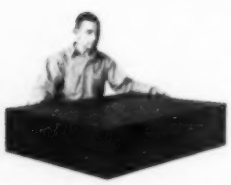
PIONEER

Arrow shows Tensilite-protected steel bang board stop on a Morrison-Knudsen project of reducing a mountain to ballast for the Union Pacific Railroad.

Tough "TENSILITE" is your answer to problems of shock and abrasion



Tensilite can be furnished in many forms, from thin pieces in ounces to huge slabs in tons. The above piece will be used in forming parts for airplanes.

Pioneer's TENSILITE has proved itself to be one of the toughest rubber compounds ever developed. In the operation pictured above, a heavy steel plate was destroyed after being battered by 15,000 tons of sharp silica rock in ½" to 2½" pieces. Now a ½" sheet of Tensilite chute lining in front of the plate lasts through 45,000 to 50,000 tons of rock, and the steel remains undamaged! In another instance, a hardened steel plate used in milling rice wore through every 24 hours. Quarter-inch Tensilite, used in the same place, showed only slight wear after a month! Tensilite is used in many forms in many industries—aggregate, gold recovery, food processing, mining, explosives, and aircraft, to name a few. Wherever abrasion or shock destroy equipment prematurely, TENSILITE is the best answer. Call your nearest Pioneer representative for full details!

Send for Pioneer's newest booklet entitled 'METABOND', a complete handbook on rubber linings, coverings, and rubber covered rolls.

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FACTORIES: PITTSBURG, CALIFORNIA

Slag Association Safety Competition

THE WYLAM OPEN-HEARTH PLANT of Birmingham Slag Co., Birmingham, Ala., and the Donora plant of France Slag Co., Donora, Penn., won highest safety honors, in their respective classes, in the second annual National Slag Association Safety Competition, conducted by the Bureau of Mines. Bronze plaques were awarded to these plants for having the best safety records in the two groups of slag plants in the competition. In addition to the trophies, Certificates of Accomplishment in Safety were awarded to each employe and official of the two winning plants.

The Wylam plant, winner of the "A" group (plants working 60,000 or more man-hours), operated 78,771 man-hours during 1950, without any lost-time injuries. The record of this operation during 1949 was nearly as outstanding when only one temporary injury with one day of disability prevented the recording of an injury-free year. The trophy award in the 1950 contest was the second successive award to a plant of Birmingham Slag Co.; the Thomas plant at Birmingham had the best record in the large-sized plant group in the 1949 contest.

Three other plants in the "A" group achieved perfect safety records in their 1950 operations and were awarded Certificates of Achievement in Safety. These were:

No. 3 plant, The Buffalo Slag Co., Inc., Tonawanda, N. Y.; 71,857 man-hours;

Midland plant, The Midland Slag Co., Midland, Penn.; 67,140 man-hours;

Converter iron and lightweight slag plant, Birmingham Slag Co., Birmingham, Ala.; 65,386 man-hours.

In the "B" group (plants working less than 60,000 man-hours), the Donora plant won first place by having a perfect safety record in operating 51,275 man-hours. Other plants of this group receiving Certificates of Achievement in Safety for injury-free records are:

Hubbard plant, The Standard Slag Co., Hubbard, Ohio; 46,764 man-hours;

Brier Hill plant, The Standard Slag Co., Youngstown, Ohio; 42,196 man-hours;

Benwood plant, The Standard Slag Co., Benwood, W. Va.; 40,474 man-hours;

Portsmouth plant, The Standard Slag Co., New Boston, Ohio; 32,781 man-hours;

No. 5 plant, The Buffalo Slag Co., Inc., Erie, Penn.; 30,049 man-hours;

Troy plant, Callanan Slag and Materials Co., Inc., Troy, N. Y.; 23,882 man-hours.

In addition, there were four injury-free plants which did not receive certificates because they did not fulfill the minimum requirement of 20,000 or more man-hours of work through the contest year, April 1, 1950, through March 31, 1951.

SAVE MONEY on these jobs with a low-cost BANTAM®

- ☐ Loading sand, gravel
- ☐ Erecting steel
- ☐ Pouring concrete
- ☐ Handling pipe, timbers
- ☐ Digging foundations and footings
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- ☐ Trenching for pipelines
- ☐ Stockpiling materials
- ☐ Digging and cleaning ditches
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- ☐ Repairing slides, washouts
- ☐ Feeding portable crushing plants
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Why go to the expense of moving in big equipment, or special work crews, when hundreds of jobs like those listed at the right can now be handled faster, more economically with a job-proved Bantam. *Costs only a fraction of the price of bigger machines* . . . mounts on new or used truck for high-speed mobility . . . has 8 fast-change attachments, with big work capacity, for profitable year 'round operation. Ideal for scattered assignments or crowded locations, where bigger, heavier machines can't go. Write for literature. Schield Bantam Co., 216 Park St., Waverly, Iowa, U. S. A.

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Bantam crane lifts 5 tons, handles ½ cu. yd. concrete bucket, 1400 to 2400# pile driver. Booms up to 50'.

Back hoe digs 100' of 5' trench per hr. Depths to 14'. Fast-change adapters for hoisting and backfilling.

Shovel or dragline loads up to 90 cu. yds. of material per hr. Drives anywhere... goes right to work.

SCHIELD BANTAM

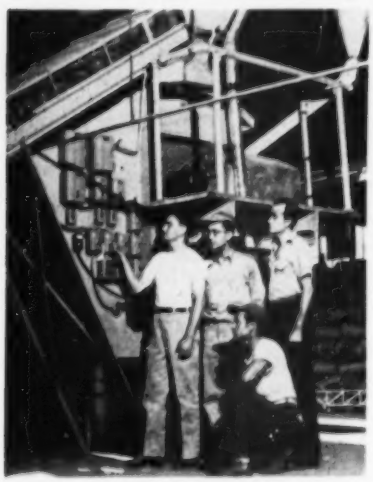
Cranes • Excavators

Get more jobs done at less cost.

The aggregate experience at the 39 competing plants in the 1950 competition was improved sharply over that of the plants in the 1949 contest. The injury-severity rate of 1.038 days lost per 1000 hours of work represented a 79 percent improvement over the 1949 record. Likewise, the frequency rate of 19.365 injuries per 1,000,000 manhours was a 24 percent improvement over the 1949 figure.

Vermiculite Plant

ZONOLITE CO., Chicago, Ill., recently began operations at its new vermiculite processing plant at Nashville, Tenn. The Nashville plant, the 35th in the United States and Canada



Operations at Zonolite's Nashville plant get underway as Ray Weeks, works manager, switches on furnace. Others in picture are, center, standing, John Huxley, plant engineer of the Lobby Mont., mine; Ed Williams, engineer at Traveler's Rest, S. C., mine; and, kneeling, Paul Lane, furnace operator at the new plant

owned or licensed by Zonolite Co., will serve western Kentucky and Tennessee. Vermiculite ore for the Nashville plant is obtained from the company's mine at Traveler's Rest, S. C. Zonolite also operates a vermiculite mine at Libby, Mont.

Moves Offices

YAHOLA SAND AND GRAVEL CO. has announced the removal of its offices from the Manhattan Building to its gravel plant at Fort Gibson, Okla.

Changes Address

DRAGON CEMENT CO., INC., has announced the closing of its Philadelphia office and the opening of a new office at 808 Wilson Building, 130 N. Broadway, Camden 2, N. J.

Change of Address

UNITED STATES LIME PRODUCTS CORP. and its sales division, Arrowhead Lime & Chemical Co., have announced the removal of their Los Angeles offices to 175 S. Alvarado St., Los Angeles 4, Calif.

A.S.T.M. Cement and Concrete Committees

THE COMBINED 1951 FALL MEETINGS of A.S.T.M. Committees C-1 on Cement and C-9 on Concrete and Concrete Aggregates, were held at Purdue University, Lafayette, Ind.

At the committee meetings on cement, the Cement Reference Laboratory reported on the completion of inspection trips made through New England, New York and Canadian laboratories. It was also reported that standard samples of cement, in lots of three 10-g. vials, for chemical analysis purposes, will be made available shortly.

Notable progress was reported in subcommittee work on many important projects. A revision of the flame photometry test method (C 228 T) is being studied with the objective of approving several types of flame photometers for use with this method; a reduction of the solution concentration and elimination of the lime content in the zero standard is also being considered; cooperative tests are being conducted to establish a better method for removing manganese; also, accelerated alkali reactivity tests are being conducted for possible revision of the tentative test method (C 227 T).

A report is in preparation which will present data on autoclave expansions of a large number of cements and length changes of the cements in neat cements and 1:2 mortar prisms during storage in water and in air for periods up to ten years. A review of the latest cooperative series of tests on sulfate resistance has been prepared and a test method, using the lean mortar bar procedure, is being prepared.

Announcement was made that a complete report on the investigation on heat of hydration will probably be made at the spring committee meetings. In the study of bleeding characteristics, the results of a cooperative series, involving ten laboratories, are to be tabulated for the committee. A mechanical mixing procedure will be included in the report, and a new series of tests, involving three cements using new apparatus just completed, is planned.

Two proposed methods for measuring strength of hydraulic cement mortars have been prepared. This involves flexural strength of mortar and a compression strength using portions of specimens used in the flexure test. The proposed method for determining the presence of calcium sulfate in hydrated portland cement mortars, reported at the previous meeting, is now being tried out by producers.

A change in the natural cement specifications (C 10 T) was approved for letter ballot, which will now specify the Vicat time of set method (C 191 T) to be used with the same limits as now specified. Also, a proposed specification for pozzolanic materials was reported under preparation.

Officers of Committee C-1 are: R. R. Litehiser, Ohio State Highway Testing and Research Laboratory, Columbus, Ohio, chairman; and W. S. Weaver, Canada Cement Co., Ltd., Montreal, Can., secretary.

At the C-9 committee meetings on concrete and concrete aggregates, final approval was reported on a proposed tentative method of test for determining chemical reactivity of aggregates by chemical methods. At least two papers are being planned on chemical reactivity for inclusion in a symposium, on the subject of durability of concrete, to be presented at the 1952 annual meeting.

Other reports disclosed that a proposed method for petrographic examination of aggregates for concrete will be distributed, and that a complete revision of the Standard Method of Sampling Fresh Concrete (C 172) is being contemplated.

Announcement was made that due to considerable negative comments on the proposed tentative specifications for aggregates for lightweight concrete, circulated at the last meeting, an entirely new approach will be made in the revision of this specification by the subcommittee. The new approach will be based on performance requirements of aggregates in addition to grading and other quality requirements.

Announcement was also made that the present Method of Test for Water Retention Efficiency of Methods for Curing Concrete (C 156 T) is to be revised.

A draft of a proposed specification for fly ash admixtures was reviewed and it was noted that no consideration had been given to the effect of fly ash on the air content of concrete; this is to be studied further.

The first cooperative test series to establish data for preparing a method to measure the resistance to abrasion of concrete will be made using the shot blast apparatus.

Officers of Committee C-9 are: K. B. Woods, Purdue University, Civil Engineering Department, W. Lafayette, Ind., chairman; and Bryant Mather, Waterways Experiment Station, Jackson, Miss.

Both committees, C-1 and C-9, will meet during A.S.T.M. Committee Week in Cleveland, Ohio, March 3-7, 1952, and at the 50th Anniversary Annual Meeting in New York City, June 23-27, 1952, at which time a symposium will be sponsored by Committee C-9 on factors affecting durability of concrete.

Rock Phosphate Plant

THE M.F.A. FARMERS CO-OPERATIVE CO., Dixon, Mo., has announced plans for building a $50,000 plant for handling bulk rock phosphate fertilizer. At present, rock phosphate received in that area is by bag shipments only.

We Engineered the Mechanical Advantages Of Big Shovels into the Dempster-Diggster

The Dempster-Diggster's ability to dig hard and stratified materials without shooting is shown in photo at right. Note ample loading clearance. Dempster-Diggster, shown at work in Florence, Ala., is the Type GRD, Model 100.

This Dempster-Diggster, shown at work in Creighton, Pa., is also loading hard and stratified material without shooting. It is the Type CR, Model 100.

The Type GRD, Model 100-HL is shown above loading Hopper Bottom car, height of which is 10'8" from rail to top of car.

Simultaneous Independent Hydraulic Crowding and Hoisting, Variable Crowd Action at Any Dipper Position and Changeable Buckets are engineered into the Dempster-Diggster. Many of the present Dempster-Diggster owners were at one time in the same position you may be in today. They needed front end loaders, but they also needed shovels that could dig out 15 to 18 foot banks. The versatility of the Dempster-Diggster, plus its economical and efficient operation, left them with only one choice. In the first place, the Dempster-Diggster can do anything a conventional front end loader can do—and do it faster and at less cost! Second, on big jobs the Dempster-Diggster is without equal for working in tight places. The Dempster-Diggster is available in either of two types of traction—pneumatic (Type GRD) or crawler (Type CR). Both types are supplied in two models—the Standard (Model 100) or High Lift (Model 100-HL). Our new catalog No. 1032, with over 35 illustrations and complete specifications, shows how this revolutionary shovel can cut your costs tremendously. For your copy fill in the attached coupon and mail today!

DEMPSTER DIGGSTER

Please send me, without obligation, your Dempster-Diggster Catalog #1032.

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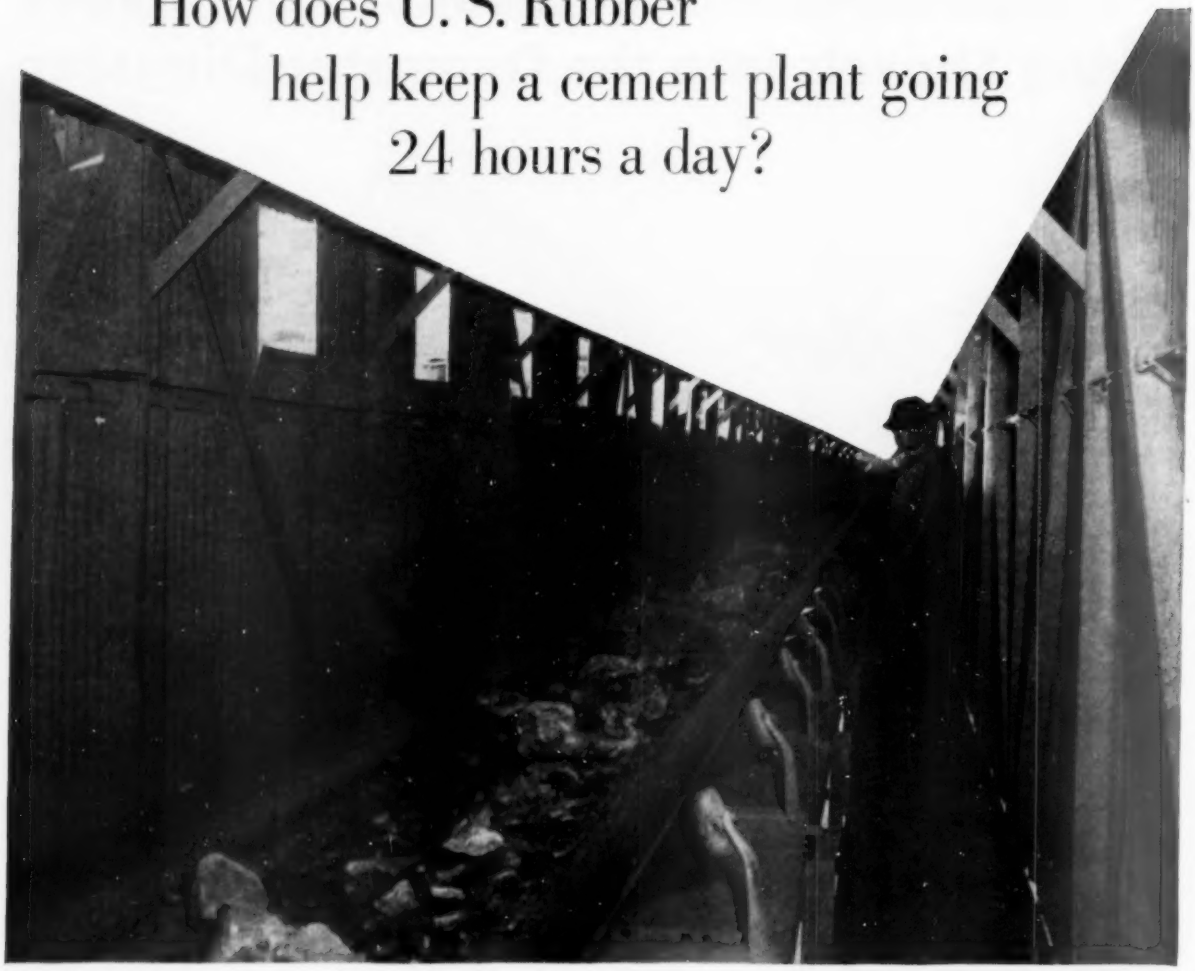
DEMPSTER BROTHERS **322 N. KNOX** **KNOXVILLE 17, TENNESSEE**

How does U. S. Rubber help keep a cement plant going 24 hours a day?



U. S. Rubber engineer inspecting belt. Inspection is a part of U. S. Rubber's continuous-servicing policy. View is looking down gallery to primary crusher.

(left) Overall view of cement plant, showing belt galleries connecting primary crusher plant (at right) with transfer house and mill.

U.S. Rubber conveyor belts are the lifeline of the plant. They help maintain the uninterrupted operation that is essential for the plant's economical production. These belts, as they carry the limestone from the pit to the kilns, withstand the abrasive action of the limestone all around the clock, seven days a week, handling 600 tons per hour.

"U.S." has always been a leader in materials handling. It will pay you to consult "U.S." engineers when you have a problem. Write to address below.

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INFORMATION

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TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

1 AIR ENTRAINMENT—Autolene Lubricants Co. has issued a new and enlarged edition of its MPC fact book, "Protex Modern Placement of Concrete." It contains question and answer information about air entrainment techniques and Protex air-entraining solutions.

2 BELT CLEANER — Stephens-Adamson Manufacturing Co. has announced the release of Bulletin No. 651, describing and illustrating the company's spring type conveyor belt cleaner. Complete diagrams and photographs are included in the bulletin along with a specification table.

3 BINS—Convair Corp. has released a data sheet, describing and illustrating its Bin-Vue bin level indicator, which is built on a new principle, and is said to operate with any bulk material that flows, either powdered, granular or lumpy. Specifications and pertinent information are contained in the publication.

4 BLOCK MACHINE—Praschak Machine Co. has issued a release describing and illustrating its automatic 400 block machine. Another pamphlet has been published on the Praschak mixer, with photographs and specifications.

5 COMPRESSORS—Clark Bros. Co., Inc., has released Bulletin No. 118, a 48-page catalog which describes and illustrates its balanced/opposed motor driven compressors. Many diagrams and photographs are contained in the publication, as well as complete specifications.

6 CONVEYORS — The Rapids-Standard Co., Inc., has published a 28-page catalog with photographs, sketches and charts that show each item of Rapistan equipment, how it works, and what type of material it will handle. The equipment includes conveyors, trucks and casters.

7 CONVEYOR—Stephens-Adamson Manufacturing Co. has issued its S-A conveyor bulletin, Vol. 198, a 20-page release covering a variety of subjects connected with conveyors.

8 CRANE—Manitowoc Engineering Works has issued Catalog 20-51, which contains 12 pages of details and photographs on its Model 2000, 25-ton crane and 1¼-cu. yd. shovel. Individual diagrams show working ranges for crane, hoe and standard and high lift shovel front end attachments, and a crane capacity chart covers the full lifting range.

9 CRUSHING—Pennsylvania Crusher Co. has published a 20-page booklet called "Crushing in the Aluminum Industry," featuring photographs, cutaway views, flow diagrams and complete descriptions of crushers, techniques and results.

10 CRUSHING — Straub Manufacturing Co., Inc. has announced a folder, No. 47, illustrating the Kue-Ken principal of crushing to minimize abrasion.

11 CURING—Pacific Wire Belt Conveyor Co. has announced the release of a 4-page brochure, illustrating and describing its curing units. A questionnaire is provided along with the bulletin.

12 DIESEL ELECTRIC SYSTEMS—Caterpillar Tractor Co. has published a 16-page booklet, Form 30178, entitled "Electricity as Required," describing and illustrating the use of Caterpillar diesel electric sets on various power applications. It briefly outlines specifications of its models ranging from 21 kw. to 31 kw., and has a chart for self-regulated and externally-regulated sets.

13 DIPPERS—Electric Steel Foundry has issued Catalog No. 189, describing and illustrating all types of Esco dippers. Discussed in the 8-page catalog are the general purpose cast-welded dipper, all-cast manganese steel dipper, coal-loading dipper and fast-back hoe dipper. Model illustrations and concise specifications are included in the bulletin.

14 DRAGLINES—Electric Steel Foundry Co. has released Catalog No. 138 which illustrates and gives specifications for all five types of Esco draglines. Described in the 8-pages are the featherweight, medium weight, heavy duty (standard), extra heavy duty (underwater mining) and stripping dragline buckets.

15 DUMP TRUCKS—The Euclid Road Machinery Co. has released a 16-page catalog, Form No. 121, describing and illustrating two rear-dump models of 22-ton capacity with spring-mounted drive axle, both with 10-speed transmission and available with standard or quarry bodies.

16 DUST CONTROL—American Wheelabrator & Equipment Corp. has published Catalog 72-B, describing and illustrating dust and fume control with Dustube collectors. This 36-page catalog contains diagrams and cutaway views, in addition to specification tables.

17 ELECTRICAL DEVELOPMENTS—Allis-Chalmers Manufacturing Co. has published another edition of its Electrical Review, Vol. XVI, No. 3. Articles included are: Supercharged Cooling of Generators, Five Stages to Stability, A Million Breaks, What Is Exciter Response?, Switchgear Control for Synchronous Motors, Graphical Differentiation Without Calculus, and Protect Your Trademark. The rate for single copies is $1.00 in advance.

18 EXCAVATORS—Marion Power Shovel Co. has released Bulletin No. 403, "Marion All-Purpose Excavators." This 32-page booklet shows working views on the entire line of Marion machines.

19 FANS — The Thermix Corp. has announced that the Prat-Daniel Corp. is offering an 8-page illustrated bulletin, No. 300, describing the design features of its new forced draft fans. The booklet illustrates various types of fan-wheels and housing, as well as including a complete list of representatives of the Thermix Corp.

20 GAS ANALYSIS—Fisher Scientific Co. has released a new edition of a reference manual describing the theory and practical application of gas analysis. The 60-page manual, which is the fourth revised edition includes complete instructions on maintaining and operating the equipment, as well as illustrations and descriptions of gas analysis apparatus.

21 GRAVEL PLANTS — Diamond Iron Works, Inc. has announced Bulletin CP-1, featuring a new single-pass gravel plant. Three plants with a capacity range from 20-65 t.p.h. are included in the bulletin, with outstanding features and full specifications.

22 GRINDING—The Patterson Foundry & Machine Co. has published a 28-page catalog, "Continuous Grinding," in which the company's ball, tube and rod mills are detailed. This catalog, No. 514, includes over 50 illustrations; technical descriptions; and charts which show size, weight, linings, ball charge, speed, power requirements and motor sizes for the various mills.

23 HOIST—Hercules Steel Products Corp. has published an illustrated bulletin, No. 8051, describing a hoist, designated as KDLL, for long wheelbase trucks, 9 and 10 ft. long with capacities up to and including 3 cu. yd., and for 12- and 14-ft. platforms.

24 IDLERS—Chain Belt Co. has announced the availability of Bulletin No. 51-81, discussing Rex belt conveyor idlers and machinery. A detailed description of zipper bunker seals is included plus data on belt conveyor trippers. A section of the 44-page booklet contains information on correct maintenance procedure.

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25 INDICATORS—The Hays Corp. has released Bulletin 51-667, on the Hays line of draft and low pressure instruments—indicators, recorders and controllers. A two-page application table is included, and features such as calibrated springs, diaphragm units and differential valve assemblies are explained.

26 INSULATION—Johns-Manville has published a 4-page folder on Superex block insulation. The descriptive material is backed with conductivity and heat loss graphs, as well as a recommended thickness table.

27 LIGHTWEIGHT CONCRETE — Great Lakes Carbon Corp. has issued an 8-page brochure, illustrating and describing the use of Permalite aggregates in concrete, as a lightweight insulating roof fill. Various features of Permalite concrete are described, along with typical specifications.

28 LINER PLATES—Universal Sewer Pipe Corp. has published a brochure entitled "Universal Vitrified Clay Liner Plates." The bulletin contains graphic drawings and tables, along with other pertinent information.

29 LUBRICATION—The Farval Corp. has issued a booklet entitled "Studies in Centralized Lubrication." The company reports that there are four keys to increased production and lowered operating expense. These four keys to lubrication are described and illustrated in the release.

30 MATERIALS HANDLING—The Yale & Towne Manufacturing Co. has released a revised edition of its "How" book of cost-cutting materials handling. Many diagrams, descriptions and graphs are included and a vis-o-graf, vis-o-graf summary and template ruler are enclosed.

31 MINERAL AGGREGATES—Indiana Mineral Aggregates Association, Inc., has compiled and is distributing the third edition, October, 1951, of its "Directory of Producers of Mineral Aggregates."

32 MIXERS—Chain Belt Co. has announced the publication of a 24-page bulletin on its horizontal and Adjusta-Hite Moto-Mixers. The release, No. 51-29, includes many photographs and complete descriptions. Also featured is a complete specifications table.

33 MOTORS—Allis-Chalmers Manufacturing Co. has released Bulletin 05B7150A, describing and illustrating types of construction and ratings of its totally-enclosed, fan-cooled motors with tube-type, air-to-air heat exchangers. Complete specifications are covered in the release, in addition to diagrams of construction features.

34 MOTOR GRADER—Caterpillar Tractor Co. has announced the "Motor Grader Operator's Handbook," a 12-page booklet in cartoon style. The handbook offers adjustments and techniques that apply to jobs ranging from high bank cuts to flat bottom ditching.

35 OIL CONDITIONER—Power Plant Products Co. has announced a 4-page folder on Powersol, a fuel oil conditioner. Drawings and descriptions are included in the release.

36 PIPE—Quinn Wire & Iron Works has announced the publication of a catalog featuring up-to-date information on standard concrete pipe construction, and including an insert page on special and unusual forms.

37 PRESTRESSED PIPE — Price Brothers Co. has published a 4-page pamphlet covering prestressed concrete steel cylinder pipe with steel and rubber joints. The release tells the story of laying the cylinder pipe on America's longest high-pressure water supply line.

38 PYROMETERS — The Bristol Co. has published bulletin No. P1244 on its line of millivoltmeter type indicating pyrometers and pyrometer controllers for temperatures up to 4000 deg. F. Indicating pyrometers for wall, switchboard and flush-panel mounting, and for portable use are described and illustrated. Also shown are rotary and toggle switches for use with the pyrometers where a number of temperatures in an oven, furnace, or process are to be measured with one instrument.

39 PYROMETERS — Minneapolis-Honeywell Regulator Co. has published Catalog 100-4, which furnishes technical data on the application and use of thermocouple pyrometric supplies. The catalog includes a complete line together with basic prices of standard thermocouple assemblies including base metal elements and Noble metal elements of all gauges.

40 RECORDER—Hays Corp. has published Bulletin 51-829, describing and illustrating its Magno-Therm oxygen recorder. Divided into five sections, it includes: an introduction, an analysis explanation, a diagramatic explanation of the recording section's operation, operational data, and chart-illustrated discussions of installation results.

41 SAFETY RULES—Clark Equipment Co., Industrial Truck Division, has issued a pocket size, 24-page booklet entitled "Safety Saves," which discusses the do's and dont's of a simple practical code of industrial truck operation.

42 SCRAPERS—Caterpillar Tractor Co. has released a 16-page booklet, Form 30177, entitled "'Cat' Scrapers Built for Your Job," describing and illustrating design, haul features, spreading and dozer type ejection on the fill.

43 SLINGS & RIGGING—Union Wire Rope Corp. has released a 48-page sling handbook and riggers manual, which illustrates 11 sling types and covers their dimensions, weights and safe working loads. The riggers section illustrates and gives step-by-step instruction on wire rope splicing, along with other pertinent data.

44 SPEED CONTROL—Electric Machinery Manufacturing Co. has released Publication 1107, discussing "Precision Speed Control with the Adjustable-Speed Magnetic Drive." This 32-page booklet contains complete information on magnetic drives and the magnetic amplifier Regutron speed control. This information is supplemented through the use of charts, diagrams and illustrations.

45 SPEED REDUCERS — The Cleveland Worm & Gear Co. has issued a folder, illustrating and describing its line of worm gear speed reducers. Among them are the type CU unit and the Speedaire fan-cooled reducer. A list of the company's field offices is contained on the back page of the folder.

46 TRACTORS — Caterpillar Tractor Co. has released an 8-page booklet, Form 30046, entitled "Caterpillar Hydraulic Controls," which describes and illustrates three models of hydraulic controls. Complete specifications, applications and pictorial cutaways showing detailed construction are included.

47 TRACTOR-SHOVEL — The Frank G. Hough Co. has announced as available a catalog, No. 208, illustrating and describing its Model HY Payloader tractor-shovel. Complete specifications, design details and action views of the 1¼-cu. yd. capacity machine are included in the bulletin.

48 TRAILERS — Schonrock Equipment Manufacturing Co. has released a 4-page pamphlet, covering its cable dump trailers. Photographs are included, along with descriptive information.

49 VERMICULITE INSULATION — American Vermiculite Corp. has announced the release of a bulletin, AIA File-37-A, under the auspices of the Vermiculite Association, Inc., of which the company is a member. The release, entitled "Vermiculite Roof Insulation Bulletin," contains a quantity chart and mixing rates.

Detach and Send Us This Post Card

(2-52)

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31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	

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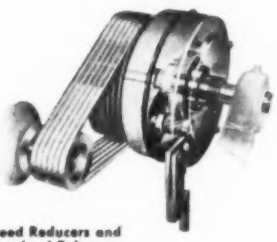
What's the speed reduction problem on your mind?



Speed Reducers and Overload Releases

Whether you manufacture machines or use them—you probably have a few that are problems because of the operating speeds required. Chances are that those problem machines operate at slow speeds . . . and that's where American can help.

Let's look at the problems—and the solutions. Your motive power probably runs at speeds upward of 1750 r.p.m. . . . your machine, slower than 154 r.p.m. You want to get that speed reduction efficiently and economically.

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The solution is an American shaft-mounted Speed Reducer. Because they are standard units, mass-manufactured, their initial cost is low. Because they are better built, by a company of long experience and top-flight engineering ability their maintenance cost is low. Because *any* speed from 11 to 154 r.p.m. can be attained from standard components, as easily and quickly as selecting an ordinary V-Belt drive, they eliminate design costs entirely. In addition they give complete freedom of machine location, permit complete flexibility of operating speed by making speed change a simple matter of changing sheaves or using American Adjustable-Speed Sheaves.

You'll be well paid to get the whole story on American Speed Reducers . . . and it's easy to do, just clip and mail the coupon right now to:

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POSITIVE PROTECTION Drive and Driven equipment have instant protection against jam and shock loads through American's exclusive Torque-Arm Overload Release. Load releases Torque-Arm, lets concentric case rotate around slow-speed shaft. Quickly reset without special tools. (Available at slight additional cost.)

AMERICAN BACKSTOPS GIVE SAVING, TOO. The *only* "hold-back" device on the market that needs no "tailoring" to equipment. Standard unit with interchangeable tapered bushings fits any shaft up to 3¼" diameter. Maximum torque 12,000 in. lbs. $52.50

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Adjustable-Speed Sheaves

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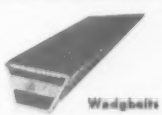

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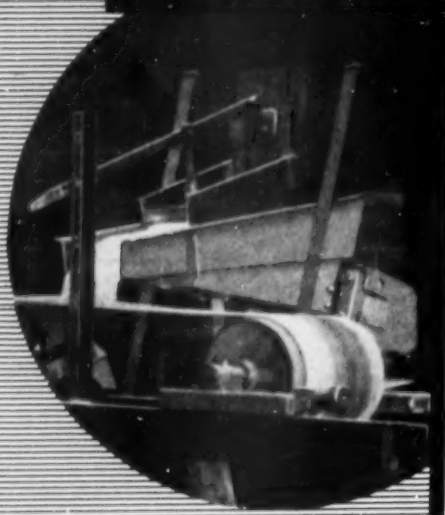

FEEDING:

Rock from dump truck to crusher . . .

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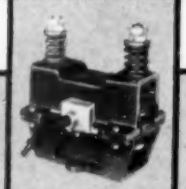

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Labor Relations Trends

(Continued from page 71)

private room; blood plasma; treatment of tuberculosis; nervous or mental cases for a period in excess of 30 days for each confinement; rest cures.

(c) *Surgical expense*

"(1) Any fee schedule with a maximum allowance in excess of the appropriate Veterans Administration prepayment surgical plan, or standard $200 commercial insurance fee schedule.

"(2) Any fee schedule in which there are any unusual allowances for special procedures, e.g., a fee for tonsillectomies which exceeds by a significant amount the corresponding fee in an appropriate Veterans Administration prepayment surgical plan, or standard $200 commercial insurance fee schedule.

"(3) Any unusual type of benefit, e.g., dental; plastic surgery for cosmetic or beautifying purposes; major surgery at home or office.

(d) *In-hospital medical expense*

"(1) Payments in excess of $5 per day, or, if benefits are graduated after the first visit or the first few visits, payments thereafter in excess of $4 per day.

"(2) Reimbursement for more than 70 days during which there were visits.

(e) *Group life insurance*

"(1) For all employes except retired employes:

"(i) A death benefit provided on basis other than a group term or equivalent basis, or which provides any cash surrender, paid-up or nonforfeitable loan value.

"(ii) An average death benefit per insured employe, including benefits under an existing plan to which the employer contributes, in excess of a total of (a) 85 percent of the average annual wages, salaries, and other compensation of the insured employes, or (b) $1500, whichever is the greater. Rounding of the face value of the policy to the next highest multiple of $250 shall, however, be permissible.

"(iii) A permanent and total disability benefit in excess of the face value of the policy.

"(2) For retired employes:

"(i) A death benefit provided on any basis other than a group term or equivalent basis, or which provides any cash surrender, paid-up or nonforfeitable loan value.

"(ii) An average death benefit in excess of (a) 40 percent of the group life insurance coverage which was provided such employes by the employer prior to retirement, or (b) $1000, whichever is the greater. Rounding of the face value of the policy to the next highest multiple of $250

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HELPFUL-INFORMATIVE IT OUTLINES THEORIES AND BASIC PRINCIPLES OF CENTRIFUGAL DUST RECOVERY!

Or, in still other shapes to fit specialized applications.
It is readily apparent that conventional cyclones with their complicated manifolds and the separate inlet and outlet ducts required for each collector, are far more restricted in their adaptability to space limitations.
A further space adaptability feature found in the Multiclone is the unusual flexibility of its inlet and outlet duct arrangements. Where headroom must be kept at a minimum, the Multiclone can be installed with side inlet and side outlet ducts, giving it an "in-line" installation that requires a minimum of vertical height.
FIG. No. 15
FIG. No. 16
20
FIG. No. 17
FIG. No. 18
21

32 PAGES OF DIAGRAMS AND INFORMATION

This booklet shows...

MULTICLONE'S SPACE SAVINGS...How the Multiclone requires less square footage, less cubic footage than most other equipment of comparable capacity and performance, thus saving costly plant space!

MULTICLONE'S ADAPTABILITY...How the Multiclone is more adaptable to varying inlet-outlet requirements—to varying space limitations—and is simpler to insulate, thus reducing installation costs!

MULTICLONE'S EFFICIENCY...How Multiclone's multiple *small diameter* tubes, made possible by its exclusive vane design, give higher centrifugal forces and more complete cleansing of *all* suspended particles—even small ones of 10 microns and less!

MULTICLONE'S LOW MAINTENANCE...How the Multiclone has no high speed moving parts to repair or replace, no pads or filters to clean or renew, nothing to choke gas flow or increase draft losses as suspended materials are recovered. Multiclone draft losses remain uniformly low—recovery efficiencies uniformly high—at all times!

Make sure that a copy of this helpful booklet is in your reference files by sending for your copy now!

NO MATTER whether you are now using mechanical dust recovery equipment or are planning the installation of such equipment at some future date, here is a booklet that is full of helpful and valuable information on centrifugal dust recovery. It not only explains the basic methods and principles involved, but also shows the important differences between small and large diameter separating tubes, shows how to simplify your duct work and reduce installation costs, and outlines many other important factors to be considered in selecting mechanical dust recovery equipment.

In addition, this informative booklet illustrates and explains how MULTICLONE'S unique *vane* design is fundamentally different...how it makes possible greater compactness, simpler installation, high recovery of the small particles as well as the medium and coarser ones, and many other facts on MULTICLONE advanced design.

A limited supply of these booklets is available for free distribution to those interested in mechanical recovery equipment and methods. Write for your copy today.

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reports user of

YUBA ARS* SCREEN PLATES

Here's what W. F. Pearson, Superintendent of Tambis Gold Dredging Company, Inc., Cebu City, Philippines, writes about YUBA revolving screen 18 months after its installation:

"...we have not done the slightest amount of work on it, not even tighten a bolt. Our old screen used to cost us thousands of pesos a year. The bevel gear and pinion, we did not renew, but are using old ones with the teeth built up by welding. These we have to repair once in a while. It is a beautiful screen."

SPECIAL SCREENS FOR MONAZITE SANDS

YUBA makes ARS Screen Plates for all screening purposes—separating, scrubbing, sizing—from ¼" thickness up. Either flat or revolving screens with taper-drilled holes will be custom-built to fit your exact needs. You will get proper fit and fast installation because YUBA screens are rolled true, cut square to close limits. *Holes can be small, closely spaced for screening sands bearing monazite or other rare earths.*

You, too, can get long wear from YUBA ARS Screen Plates. They are made of high carbon, high manganese alloy steel with a Brinnell hardness of 200 to 250, assuring great resistance to abrasion. They give long, trouble free service; that's why so many dredge operators standardize on YUBA ARS Screens and liners.

*United States Steel product.

Sand and gravel operators especially invited to consult with Yuba on perforated screen requirements.

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shall, however, be permissible.

"(iii) A permanent and total disability benefit in any amount.

(f) *Accidental death and dismemberment benefits*

"(1) For all employes except retired employes:

"(i) A benefit on any other basis than a group term or equivalent basis.

"(ii) An average face value per insured employe, including benefits under an existing plan to which the employer contributes, in excess of (a) 85 percent of the average annual wages, salaries and other compensation of the insured employes, or (b) $1500, whichever is the greater. Rounding of the face value of the policy to the next highest multiple of $250 shall, however, be permissible.

"(2) For retired employes: Accidental death and dismemberment benefits in any amount.

(g) *Benefits to dependents of employes*

"Any benefits provided to employes' dependents except in cases where:

"(1) The employe contributes at least 40 percent of the gross cost of such benefits and

"(2) Dependent coverage is limited to an employe's spouse and children under 19 years of age and

"(3) The benefit meets the requirements of Section 3 of GWR 19 and does not contain any feature listed among the review criteria set forth in this resolution.

"Any benefit not satisfying these three requirements shall be referred to the committee.

(h) *Benefits to retired employes*

"Any benefit provided to retired employes, except those permissible under subparagraph (e) (2), above.

(i) *Benefits provided under statutory plans*

"Any plan under which the employer supplements, directly or indirectly, any statutory temporary disability, hospital, surgical, or in-hospital medical expense benefit in an amount which will cause the total of (1) the benefit under the statutory plan and (2) the benefit under the employer's plan to exceed the definitions in GWR 19 or to contain any feature listed among the review criteria set forth in this resolution.

(j) *Any other unusual provision*

"4. Plans in which employes contribute:

"(a) In plans under which the employe pays at least 40 percent of the gross cost of any health and welfare benefit, such benefit shall not be referred to the committee, even though the benefit may vary from the definitions in GWR 19 or contain a feature listed among the review criteria set forth in this resolution. This provision, however, is limited to benefits for employes and does not include benefits for employe dependents.

All cases involving benefits for employe dependents are governed by the provisions of Section 3 of GWR 19 and paragraph 3 (g) of this resolution.

"(b) This provision does not preclude the committee or the board, as the case may be, from approving a benefit where (i) the percentage of employe contribution is less than 40 percent or (ii) the employe bears none of the cost. Approval of benefits in such cases will be granted where the plan is found to be not unstabilizing."

N.L.A.'s 50th Anniversary

THE NATIONAL LIME ASSOCIATION is celebrating an important milestone in its history. This year marks its 50th year in continuous operation. Plans are being made to make next spring's 50th annual convention a particularly festive occasion by a Golden Anniversary Celebration. The convention will be held at The Homestead, Hot Springs, Va., May 8-10, 1952.

Lightweight Aggregates

MINERAL PRODUCTS CO., Kansas City, Kan., and Buildex, Inc., Ottawa, Kan., are building plants for the production of lightweight aggregates from Kansas clays and shales. Establishment of these plants is based on the results of several years of intensive investigation of Kansas clays and shales by the State Geological Survey and representatives of the ceramic industry.

Each of the new plants will have a daily capacity of approximately 600 cu. yd. of lightweight concrete aggregate, the equivalent of about 33,000 concrete block. The Kansas City plant will feature a relatively new application of the Dwight-Lloyd sintering process. Buildex, Inc., is installing two rotary kilns. Kenneth A. Spencer is president of Mineral Products Co., and George K. Mackie is president of the Buildex company.

To Install Kiln

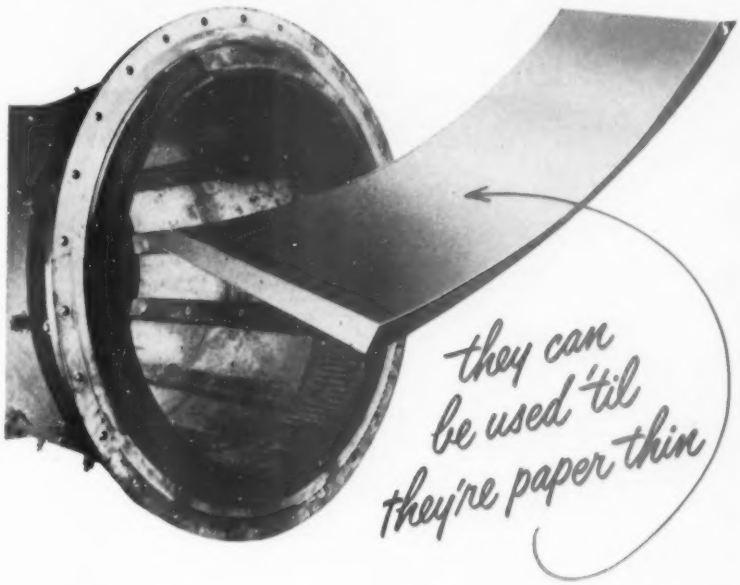
MANITOWOC PORTLAND CEMENT CO., Manitowoc, Wis., recently announced plans for the installation of a new 340-ft. kiln which is expected to double the plant's present production. The kiln will be housed in a 75- x 400-ft. building, and its capacity is expected to equal the total output from three 160-ft. kilns now in operation.

The building will be of reinforced steel and concrete construction with corrugated asbestos siding and will be erected over pilings. General contract for the concrete work, valued at $136,000, has been awarded to Hamann Construction Co. and Kasper Construction Co., both of Manitowoc.

Future plans of the company call for the installation of electrical precipitators and additional mechanical dust collectors which are expected to recover 96 percent of the stack dust.

Lengthen the life of your mill linings with

U·S·S LORAIN ROLLED PLATE LINERS...



YOU get the full life of your mill lining when you install U·S·S Lorain Rolled Plate Liners. They're so rugged that they remain serviceable until worn paper thin. And because plates of reduced thickness can be used, you increase the usable diameter of your mill, boost the output.

U·S·S Lorain Rolled Plate Linings are made to accurate size and in easy-to-handle sections . . . save hours of installation time and greatly reduce mill down-time. Economy in maintaining both shell and linings is assured when you install these tough, long-lasting linings. Close fits between liner plates and between the liner plates and lift bars eliminate shell wash and allied troubles. And because plates are made interchangeable, severe localized wear at feed or discharge ends may be balanced by shifting the plates . . . restoring grinding efficiency at only partial lining cost.

There's a U·S·S Lorain Rolled Plate Lining to fit any type of mill, available through leading mill manufacturers whose names will be furnished upon request.

U·S·S GRINDING BALLS

For the best possible grinding results, be sure to use U·S·S Grinding Balls. They're specially made for the industry to the most exacting specifications of hardness and toughness. Available in standard sizes from ¾" to 5" in diameter. For complete information, return the coupon below and get our FREE booklet on U·S·S Grinding Balls.

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Without obligation on my part, please send me your FREE booklet on U·S·S Grinding Balls.

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U·S·S LORAIN ROLLED PLATE LININGS AND U·S·S GRINDING BALLS

USS

UNITED STATES STEEL

How NAYLOR gives you EXTRA STRENGTH in Light-weight Pipe

If you want to know why Naylor pipe out-performs other light-weight pipe in mining service, here is just one of the reasons. If you could look inside Naylor's distinctive spiral, you would see the lockseam spiralweld structure which extends in spiral form throughout the length of the pipe. This spiralwelded truss provides greater structural strength—under pressure, compression, collapse, and beam load than any other iron or steel pipe of the same nominal wall thickness. That's why you can use Naylor Pipe on jobs normally requiring heavier-wall pipe. Write for Bulletin No. 507.

NAYLOR PIPE

Naylor Pipe Company
1237 E. 92nd St., Chicago 19, Ill.
New York Office:
350 Madison Ave., New York 17, N.Y.

FINANCIAL

RECENT DIVIDENDS

Alpha Portland Cement Co.	$1.50	Dec. 10
Arundel Corp.—E	.50	Dec. 24
Arundel Corp.—Q	.25	Dec. 24
Bessemer Limestone & Cement Co.	.50	Dec. 28
Bessemer Limestone & Cement Co.—pf.—Q	.50	Jan. 1
Calaveras Cement Co.	.25	Dec. 26
California Portland Cement Co.	.40	Jan. 24
Canada Cement Co., Ltd.—pf.	.32½	Mar. 20
Canada Crushed Stone Co., Ltd.—pf.	1.50	Jan. 2
Consolidated Cement Corp.—Cl. A	1.05	Dec. 17
Coronet Phosphate Co.—Q	1.50	Dec. 21
Coronet Phosphate Co.—Sp. Yr. E	6.00	Dec. 21
Dragon Cement Co., Inc. (formerly Lawrence Portland Cement Co.)—Sp.	.50	Dec. 28
Dragon Cement Co., Inc.—Q	.25	Dec. 28
General Portland Cement Co.—Yr. E	1.00	Dec. 17
General Portland Cement Co.	.50	Dec. 17
Giant Portland Cement Co.—Stk.	2%	Dec. 26
Gypsum, Lime & Alabastine, Can., Ltd.	.50	Mar. 1
Gypsum, Lime & Alabastine, Can., Ltd.	.50	June 2
Hercules Cement Corp.	.25	Jan. 2
Hercules Cement Corp.	.25	April 1
Ideal Cement Co.—E	.40	Dec. 31
Ideal Cement Co.—Q	.50	Dec. 31
Industrial Silica Corp.—pf.—Q	.16	Mar. 10
Kelley Island Lime & Transport Co., The—E	.60	Dec. 14
Kelley Island Lime & Transport Co., The—Q	.35	Dec. 14
Keystone Portland Cement Co.—E	.25	Dec. 14
Keystone Portland Cement Co.—Q	.50	Dec. 14
Lehigh Portland Cement Co.—Q	.30	Mar. 1
Lone Star Cement Corp.—Yr. E	.12	Dec. 18
Lone Star Cement Corp.—Q	.35	Dec. 18
Marquette Cement Mfg. Co.—Yr. E	.60	Jan. 4
Medusa Portland Cement Co.	.60	Dec. 21
Missouri Portland Cement Co.	1.00	Dec. 17
Monolith Portland Cement Co.—pf.	.85	Dec. 15
Monolith Portland Midwest Co.—pf.	.70	Dec. 15
National Gypsum Co.—Stk.	2%	Dec. 15
National Gypsum Co.—Q	.35	Dec. 15
National Gypsum Co.—pf.—Q	1.12½	Dec. 1
Nazareth Cement Co.—Q	.25	Mar. 15
Northwestern Portland Cement Co.	1.00	Dec. 20
Northwestern Portland Cement Co.—1st pf.—Q	1.50	Dec. 20
Northwestern Portland Cement Co.—2nd pf.—Q	1.14	Dec. 20
Pacific Coast Aggregates, Inc.—E	.16	Dec. 19
Pacific Coast Aggregates, Inc.	.10	Dec. 19
Peerless Cement Corp.	.25	Mar. 14
Penn-Dixie Cement Corp.—E	.40	Dec. 14
Penn-Dixie Cement Corp.	.40	Dec. 14
Penn. Glass Sand Corp.—Q	.30	Jan. 1
Penn. Glass Sand Corp.—pf.—Q	1.25	Jan. 1
Riverside Cement Co.—Cl. A—Ac.	.50	Mar. 15
Santa Cruz Portland Cement Co.—E	1.25	Dec. 20
Santa Cruz Portland Cement Co.—Q	.75	Dec. 20
Spokane Portland Cement Co.	.10	Mar. 10
Spokane Portland Cement Co.	.10	June 10
Spokane Portland Cement Co.	.10	Sept. 10
Spokane Portland Cement Co.	.10	Dec. 10
Superior Portland Cement, Inc.	.25	Dec. 21
United States Potash Co.—E	.20	Dec. 15
United States Potash Co.—Q	.45	Dec. 15
United States Gypsum Co.—E	1.50	Dec. 24
United States Gypsum Co.—Q	1.00	Dec. 24
United States Gypsum Co.—7% pf.—Q	1.75	Jan. 2
Warner Co.—Q	.40	Jan. 15

LONE STAR CEMENT CORP., New York, N. Y., for the nine months ended September 30, has reported the following earnings:

	1951	1950
Sales	$53,201,837	$48,108,996
Operating profit	17,502,239	15,193,212
Total income	18,010,957	15,741,083
Profit before inc. taxes	15,242,949	13,154,322
Federal & foreign income taxes	8,336,294	5,745,308
Federal excess profits taxes	1,250,000	
Net profit	5,656,655	7,409,014
Earned per share	$1.99	$2.60
No. capital shares	2,845,791	948,598

BLUE DIAMOND CORP., Los Angeles, Calif., has reported gross sales of $3,834,229 for the three months ended September 30, 1951, compared with $3,564,735 for the comparable 1950 quarter. This brought the total for the first nine months in 1951 to $11,526,-129, as against $9,676,211 for the same period in 1950.

THE KELLY ISLAND LIME & TRANSPORT CO., Cleveland, Oh o, has reported the following statement of income for the nine months ended September 30:

	1951	1950
Net sales	$ 8,968,263	$ 7,787,439
Cost of sales	6,876,105	5,879,725
Selling, etc., expenses	872,515	663,463
Operating profit	1,219,643	1,244,251
Other income	39,459	35,529
Total income	1,259,102	1,279,780
Federal income tax	623,391	524,710
Excess profits tax	116,961	
Net profit	518,750	755,071
Earnings surplus, 1-1	1,321,283	809,174
Dividends	324,400	370,742
Earnings surplus, 9-30	1,515,633	1,193,503
Earned per share	$1.68	$2.44
No. of shares	308,952	308,952

CANADA CRUSHED & CUT STONE, LTD., Hamilton, Ont., for the five month period from its incorporation to September 30, 1951, reported a net profit of $153,498, after deduction of bond and debenture interest and $128,-267 for depreciation and depletion, and $186,875 for provision for income taxes.

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., has reported earnings for the nine months ended September 30, as follows:

	1951	1950
Sales	$39,387,993	$32,539,207
Profit after depr. and depl.	11,446,938	8,762,803
Federal income taxes	7,230,000	3,675,000
Net profit	4,216,938	5,087,803
Earned per share	$2.22	$2.68
No. capital shares	1,901,560	950,780

NEW ENGLAND LIME CO., Canaan, Conn., has reported a net profit of $111,945 for the nine months ended September 30, 1951, as against a net profit of $125,370 for the same period in 1950. This amounted to $1.59 per share on 69,622 shares for the 1951 period, and $1.79 per share on 69,322 shares for the 1950 period. Net sales for the same period in 1951 were listed at $1,563,074, compared with $1,396,099 in 1950.

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., has reported the following earnings for the nine months ended September 30:

	1951	1950
Net before taxes	$ 2,313,579	$ 1,811,729
Federal income tax	1,292,833	779,406
Net profit	1,020,746	1,032,323
Earnings, pfd. share	$32.93	$33.30
Earnings, com. share	1.40	2.84
No. of pfd. shares	31,000	31,000
No. of com. shares	643,720	321,860

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., has reported a

SCREEN IT ACCURATELY

SCREEN IT ECONOMICALLY

—on Hewitt-Robins Vibrating Screens

You need closest possible control of sizes. You need lowest possible cost per ton. You can get both by putting the right vibrating screen on the job.

Here's where Hewitt-Robins can help. We introduced the circle-throw principle. We originated the elliptical throw. Today, we make vibrating screens in a wide range of types and kinds . . . handling everything from 9,000-lb. rocks to tiny specks . . . to perform every operation from scalping through sizing to dewatering.

The line of Hewitt-Robins Vibrating Screens is complete . . . ranging from 16" x 30" to 72" x 192" . . . floor-mounted or suspended . . . with one, two or three decks.

Proper sizing is no problem . . . when you put it up to Hewitt-Robins. Your cost per ton will be low. Your maintenance expense will be minor; many Hewitt-Robins Vibrating Screens are still going strong after more than 12 to 20 years of continuous service.

Screen your product accurately. Screen it economically . . . on Hewitt-Robins Vibrating Screens. Tell us your need. We'll give you the *one best* answer. Write to Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Avenue, Passaic, New Jersey.

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Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

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BELT CONVEYORS (belting and machinery) • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
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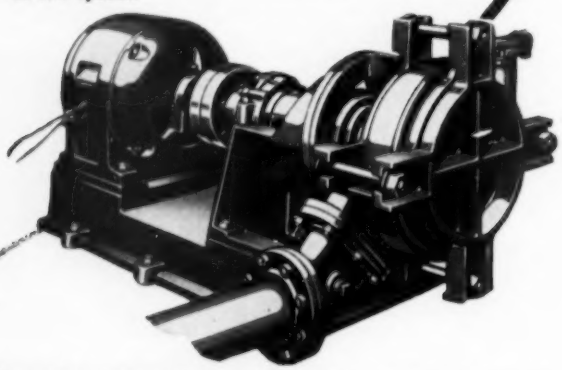
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

10 REASONS WHY Morris TYPE "R" SLURRY PUMP is Ideal for Cement Mills

1. **LOW PRESSURE STUFFING BOX** — Subject to suction pressure only. Maximum packing life. No high pressures to force an excessive amount of solids into stuffing box.
2. **LOW SEALING WATER PRESSURES** — Negligible dilution of slurry when pumps are properly maintained.
3. **KEEPS FLOORS AND PITS CLEAN** — No spilling of slurry past the shaft.
4. **MAXIMUM LIFE OF WEARING PARTS** — Because the alloy is selected to suit the job — because Morris' pumps are applied to give low velocities through impeller and casing — because Morris pumps operate at low speeds.



5. **HEAVY SHAFT AND BEARINGS** — Eliminate dangerous vibration due to any abnormal operating conditions — long and satisfactory bearing life.
6. **EASY TO REPAIR** — Only four bolts need be loosened to renew impeller and shaft sleeve — not necessary to disturb piping.
7. **SAVES POWER** — In many instances able to move more material per KW.
8. **NO SEPARATE OR INTERMEDIATE SUCTION TANK REQUIRED**
9. **FLEXIBLE PERFORMANCE** — Operates satisfactorily under high positive heads or, if necessary, under a vacuum through moderately long suction lines.
10. **SAVES PIPING EXPENSE AND FLOOR SPACE** — Because the Morris Type "R" allows 72 different combinations of suction and discharge nozzle positions.

For long term efficiency — and economy . . . for simplified assembly and disassembly — and a minimum of shutdowns . . . specify Morris Type "R" Pump. Free consultation with a Morris engineer at your request.

Write for Bulletin #181

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Sales Offices in Principal Cities

MORRIS *Centrifugal Pumps*

net profit of $223,297 for the quarter ended September 30, 1951, as compared with a net profit of $272,445 for the same quarter in 1950. This amounted to $17.13 per preferred share on 13,033 shares, and $0.29 per common share on 736,967 shares, for the 1951 period, as against $19.48 per preferred share on 13,985 shares, and $0.35 per common share on 736,973 shares for the 1950 period. Sales for the 1951 period were listed at $4,592,656, compared with $4,613,419 for the corresponding quarter of 1950.

AMERICAN POTASH AND CHEMICAL CORP., Los Angeles, Calif., has reported net earnings of $1,512,163, or $2.50 per share on A and B stock, for the nine months ended September 30, 1951. This compares with net earnings of $1,806,930, or $3.04 per share, for the corresponding period of 1950. Sales amounted to $13,555,011 in the 1951 period, compared with $12,316,247 for the 1950 period.

CERTAIN-TEED PRODUCTS CORP., Ardmore, Penn., has given its account of income for the nine months ending September 30, as follows:

	1951	1950
Net sales	$49,009,012	$39,054,131
Contr. proc. profits	302,812	279,804
Total	49,311,824	39,333,936
Costs & expenses	40,916,405	32,122,436
Operating profit	8,395,419	7,211,500
Other income, net	24,766	325,092
Total income	8,420,185	7,536,592
Income taxes	4,682,722	3,252,474
Net income	3,737,463	4,284,117
Earnings, com. share	$2.30	$2.62
No. of com. shares	1,623,829	1,623,829

VIENNA CONCRETE CO., INC., Vienna, Va., has increased its maximum capital stock from $30,000 to $100,000, according to an amendment to its charter filed with the Virginia State Corporation Commission. M. J. Bles is president of the company.

UNITED STATES GYPSUM CO., Chicago, Ill., for the nine months ended September 30, has reported its income as follows:

	1951	1950
Net sales	$145,462,185	$127,901,168
Net before taxes	41,967,679	39,411,579
Income taxes	26,695,000	18,600,000
Net profit	15,272,679	20,811,579
Earnings, pfd. share	$195.25	$266.06
No. of pfd. shares	78,222	78,222
Earnings, com. share	$9.29	$12.75
No. of com. shares	1,599,752	1,599,752

IDEAL CEMENT CO., Denver, Colo., has reported a net income of $4,945,475 for the nine months ended September 30, 1951, or $3.57 per share on 1,386,213 shares. Sales and other revenue were listed as $29,692,865.

PEERLESS CEMENT CORP., Detroit, Mich., for the nine months ended September 30, reports the following earnings:

	1951	1950
Net profit	$863,064	$893,983
Dividends	310,065	310,062
Balance	552,998	583,921
Earned per share	$2.78	$2.88
No. of shares	310,062	310,062

CONSOLIDATED CEMENT CORP., Chicago, Ill., for the nine months ended September 30, 1951, reports a net profit of $395,900, or $3.96 per share on 99,916 shares. This compares with a net profit of $375,700, or $3.76 per share for the corresponding period of 1950. Net sales for the 1951 period are listed as $3,791,500, compared with $3,408,600 for the 1950 period.

New Incorporations

Vogel Sand & Gravel Co., New Holstein, Wis., has been incorporated with 500 shares of stock, no par value. Minimum capital was listed at $1000. The incorporators are George and Sylvester Vogel and Ivan Tupper.

Arkansas Talc Co., Inc., Bryant, Ark., was recently incorporated by M. E. Peace and James T. and H. K. Duke, with a starting capital of $300.

Lawrence Sand & Gravel Co., East St. Louis, Ill., has been incorporated with a stated capital of $20,000. Leo J. Dougherty is president of the new corporation and his son, Donald Dougherty, is secretary.

Architectural Stone Co. of Fort Worth, Texas, has been incorporated by J. Herschell Mexey, A. E. Eiseman and J. H. Puckett, with a capital stock of $10,000.

Gililo Concrete Co., Inc., San Antonio, Texas, has been incorporated with $1000 capital stock. The incorporators are E. P. Womack, Mrs. Esther Jenkins and Mrs. Loyd LeBlanc.

Sterling Sand Co., Buffalo, N. Y., was recently incorporated by William R. Brennan, Lawrence F. Hossenlopp and Ronald Ruhlman. Capital was listed at $100,000.

Travis Austin Stone Corp., Austin, Texas, was recently incorporated with $1200 capital stock. C. M. Baker, Andrew C. Gatlin, Sr., and Hal M. Hatter were listed as incorporators.

Potomac Cast Stone, Inc., Alexandria, Va., has been incorporated to deal in cast stone, tile, terrazzo and various kinds of concrete products. Minimum capital was listed at $150,000. Peter S. Arban, Washington, D. C., is president of the new corporation.

A. F. Gelhar Co., Inc., Berlin, Wis., was recently incorporated with 100 shares of stock, no par value. Minimum capital was listed as $25,000. The company will deal in sand and gravel and was incorporated by A. F. Harvey and Amanda Gelhar.

Butler Gravel Co., Milwaukee, Wis., was recently incorporated with 100 shares of stock, par value, $50. Minimum capital was listed as $2500. The incorporators are George and Agnes Normington and Herman J. Scholl.

Wilson Mica Corp., Spruce Pine, N. C., has received a charter to mine and deal in mica products and other minerals. Authorized capital stock is $100,000. The incorporators are Roy Weld, Vernon Wilson and Frank Watson.

Burlington Rock Crusher Co., Kansas City, Mo., was recently incorporated with 5000 shares of stock, n.p.v. Starting capital was listed as $50,000. The incorporators are P. Toburen, E. B. Toburen and D. Roberts.

Criss Concrete, Inc., Augusta, Kan., recently filed articles of incorporation. Authorized capitalization was listed as $50,000. R. D. Criss, Edith Criss and J. R. Lundblade are the incorporators.

GET A FREE Tuffy® SLING AND PROVE TO YOURSELF IT'S MORE FLEXIBLE!

Yes, here's your chance to see for yourself the braided wire fabric of which TUFFY Slings are made. Tie it in knots, kink it—then see how easily a Tuffy sling can be straightened out without material damage.

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HOW Tuffy SLINGS ARE MADE

Scores of wires are stranded into nine parts, then machine woven into an interlaced wire fabric. This braided fabric gives extra safety and enduring strength. Even cutting one of the 9 parts does not result in stranding of the sling.

11 TYPES—PROOF TESTED FOR SAFETY

There are 11 different types of Tuffy Slings, each one proof-tested to *twice* its safe working load. And the safe working load is plainly marked on metal tags on each sling. Also, Union Wire Rope engineers will help work out special sling problems. If you have your own rigging loft, Tuffy braided wire fabric is available by the reel.

FREE SAMPLE—MAIL COUPON

To show you the difference between TUFFY Braided Wire Slings and ordinary wire rope slings, we have made up a quantity of 3-foot slings. We want you to have one so that you can test it and prove to yourself that TUFFY Slings really are better. Mail the coupon below today for yours.

UNION WIRE ROPE CORPORATION
Specialists in Wire Rope, Braided Wire Fabric and High Carbon Wire
2156 Manchester Ave. Kansas City 3, Mo.

Gentlemen: Please have my Union Wire Rope fieldman deliver me a FREE Tuffy Sling.

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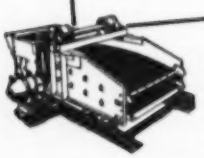
"We Switched to a DEISTER screen to average ...120 tons per hour"!



One of the most modern, all-steel plants in the Mid-West . . . You can tell that from this photograph. And the Miller Brothers Gravel Company, plant, at West Milton, Ohio, is modern and efficient because the Millers, Bill and Dale, spent months inspecting other operations and comparing notes before they built this one.

The screen they SWITCHED to is a Deister 4′ x 10′ double-deck Vibrating Screen.

Says Mr. Miller:

"We made a complete survey and visited many plants. Every Deister Screen user we talked to was pleased with the performance—and particularly with the flexibility in changing cloth. That means a lot to us because we have to make many sizes to meet the wide range of specifications called for today."

As a result, the Millers, who never before had owned a Deister, switched makes to assure an average 120 tons an hour, and to handle up to 190 tons per hour. And they've never had cause to regret it, they are frank to say. Deister Vibrating Screens offer you more advantages for BETTER SIZING — CHEAPER than any other screens you can buy. Be sure to learn the story before you buy.

Flow of Work—Trucks dump into 7″ grizzly at the hopper. A mechanical feeder throws it on a 69-foot power conveyor which discharges onto the 4′ x 10′ double-deck Deister, which usually carries a 2-inch mesh on the top deck, 1-inch mesh on the bottom deck. Oversize recirculates through a cone crusher where it is returned, via a 42 foot long conveyor onto the main power conveyor belt. Sized material is carried on a 40-foot conveyor to a steel bin for truck loading . . .

That's real efficiency in handling material . . . a system that averages 120 tons per hour, handles up to 190 tons per hour.

DEISTER SCREENS

DEISTER MACHINE COMPANY

FORT WAYNE 4, INDIANA

MANUFACTURERS NEWS

Denver Equipment Co., Denver, Colo., has appointed the Road Machinery Supply Co., Duluth, Minn., as distributor in northern Wisconsin and northern Minnesota. Charter, Inc., Ishpeming, Mich., has been named distributor in the upper peninsula region of Michigan.

Straub Mfg. Co., Inc., Oakland, Calif., has appointed the following distributors for Kue-Ken crushers in the State of Oregon: Cal.-Ore Machinery Co., Inc., Medford, Ore.; Edward L. Kropp Co., formerly Western Road Machinery Co., Portland, Ore.

Diamond Iron Works, Inc., Minneapolis, Minn., announces that J. P. Blaul has been elected president of Diamond Iron Works, Inc., and the Mahr Manufacturing Co. division following the resignation of L. J. Reay. Mr. Reay will continue to serve as a member of the board of directors. Prior to joining the company in 1951, Mr. Blaul owned and operated a business of his own. He has had considerable experience in selling and merchandising problems, having been affiliated with two nationally known concerns for over 15 years.

J. P. Blaul

Sterling Electric Motors, Inc., Los Angeles, Calif., announces that production has started in the new $2,000,000 plant in Van Wert, Ohio, where gears, splines and gear boxes will be produced. E. O. Danielson, general factory manager, is in charge of the new plant.

Thermoid Co., Trenton, N. J., has received the radio safety Award of Merit of the New Jersey State Safety Council for outstanding accomplishment in the field of public information on accident prevention covering all areas of activity, performed through the Thermoid Safety Campaign and Highway Cavalcade on radio station WTTM, Trenton, N. J., during the summer of 1951.

Caterpillar Tractor Co., Peoria, Ill., announces that Harry H. Fair has been elected chairman of the board of directors to succeed the late C. L. Best, who died in San Francisco on September 22. Mr. Fair's connection with the tractor business dates back to 1918 when he became a director of Best Tractor Co., one of the constituents of Caterpillar Tractor Co. He was the prime mover in the formation of Caterpillar and has continuously been on its board and executive committee. A. H. Brawner, president of W. P. Fuller & Co., San Francisco,

has been named to replace Mr. Best on the board. Victor A. Woodling has been appointed service development manager. He was formerly dealer publications supervisor and will be succeeded in this position by Robert H. Hawkins, formerly an instructor in service training for Caterpillar.

The Pangborn Corp., manufacturer of blast cleaning and dust control equipment, Hagerstown, Md., recently honored 77 veteran employes at the first annual dinner of the Pangborn Quarter-Century Club, and presented them with gold wrist watches.

Barber-Greene Co., Aurora, Ill., has announced the appointment of M. A. Gailis as service manager in the Latin-American territory covering South and Central America as well as the Caribbean Islands. He was formerly Area VI service manager at Minneapolis and will be succeeded in this position by Robert Cunningham, who has been service engineer in the Aurora office.

Link-Belt Co., Chicago, Ill., announces the appointment of William J. Brinkworth as representative, distributor sales, Southwestern division, with headquarters at the plant in Houston, Texas, in addition to his duties as field manager, oil field distributor sales.

The Timken Roller Bearing Co., Canton, Ohio, has appointed Robert E. Cook as sales engineer of the steel and tube division in the Cleveland office. He was formerly field engineer.

Johns-Manville Corp., New York, N. Y., has formed a new exploration department and a new sales and merchandise department in Canada, with George K. Foster, vice-president of Canadian Johns-Manville, as head of the exploration department, and John C. Kelleher, also a vice-president of Canadian Johns-Manville, as sales and merchandise manager of the asbestos fibre division.

Poor & Co., Chicago, Ill., has appointed W. A. Rundquist to the position of director of advertising and public relations in addition to his duties as sales promotion manager for Pioneer Engineering works, a subsidiary. He will maintain his headquarters in Minneapolis, Minn. Mr. Rundquist was graduated from North Dakota State College in 1929 with a degree in mechanical engineering, and held positions with Bell Telephone Laboratories and Minneapolis-Honeywell prior to World War II. During the war, he served as an officer with the U. S. Army, Corps of Engineers, and since October, 1945, has been in charge of advertising and sales promotion activities for Pioneer Engineering Works.

W. A. Rundquist

NEW "35" SINKER

Easy to handle, the new Thor 35-lb. Sinker features new Blower Valve for full line pressure blowing, in addition to all the many design and operating advantages that have made Thor Rock Drills outstanding performers wherever percussion tools are used.

Ask for Circular JE-1139

NEW SINKER LEGS

3 GREAT MODELS

Ask for Circular JE-1132

Compact air feed leg clamps to standard Sinker Rock Drill, converts upward lifting action to positive forward feeding pressure. ONE MAN can carry it . . . set it up . . . drill round after round without wasted time or motion.

GREAT COST-CUTTERS WITH CARBIDE BITS

Replace larger Drifters, jumbo set ups, large diameter drill steels and bits, large sizes of air compressors, air line and explosives!

INDEPENDENT PNEUMATIC TOOL COMPANY
AURORA, ILLINOIS

FREE! Ask for Mining Tool Catalog MC-1

BUY IT from your DISTRIBUTOR

Thor PORTABLE POWER TOOLS

ELECTRIC • PNEUMATIC

MOVE MORE YARDAGE...
at less cost..

Above is an example of how a Sauerman rapid-shifting scraper digs wide and deep in hard-packed gravel bed — averages 42 loads moved hourly to screening plant.

with a one-man

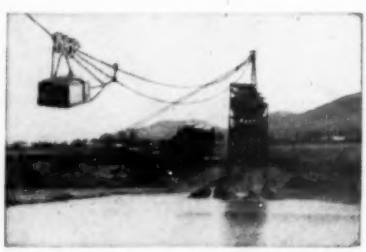
SAUERMAN MACHINE

Power and labor are saved in excavating gravel, cleaning ponds, stripping overburden, stockpiling, and similar material handling work, by the Sauerman method which combines digging, hauling and dumping of material in a continuous, rapid process controlled by one operator.

For hauls up to 1,000 ft. in dry pits or banks or for stockpiling any kind of bulk material — use a Sauerman Power Drag Scraper. For digging from a wet pit, river or lake — use a Sauerman Slackline Cableway. Rapid and dependable results at minimum cost. As little as 2c a cubic yard covers operating charges.

Specifications, operating data, capacity charts, photos of typical installations of varied types and sizes — all are in the Sauerman Catalog. Write for this free book today.

This picture shows how a small Sauerman scraper handles seasonal storage of 30,000 tons of surplus output at crushing plant, piling the surplus material in a single long pile and later reclaiming to a car-loading hopper.



Here is a 2½ cu. yd. Sauerman slackline cableway moving gravel out of a deep pit 400' wide by 900' long which it excavated during the last two seasons while producing about 300,000 cu. yd. a season.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

530 S. Clinton St. Chicago 7, Ill.

MANGANESE STEEL CASTINGS

for PULVERIZERS CRUSHERS ROLLS SCREENS

for SHOVELS DREDGES CRANES CONVEYORS

The Frog, Switch & Mfg. Co.

Established 1881 CARLISLE, PA.

Sterling Electric Motors, Inc., Los Angeles, Calif., has appointed the following distributors: Industrial Electric Co., Modesto, Calif.; Butte Machinery Co., Butte, Mont.; Pomona Electrical Machinery Co., Inc., Pomona, Calif.; Industrial Motor Electric, Woodland, Calif.; Meyer Bros. Co., Phillipsburg, Penn.; and Transmission Equipment Co., New York, N. Y.

Westinghouse Electric Corp., Pittsburgh, Penn., has announced that it will undertake a $296,000,000 expansion program to extend beyond 1953. This project will be the second such program undertaken since the end of World War II. Major projects have already been started as part of the plan which, it is said, will increase productive capacity by 50 percent.

Smith Engineering Works, Milwaukee, Wis., announces that Donald D. Barnes, formerly executive vice-president, has been named president and treasurer to succeed the late Charles F. Smith who died December 10. Gerald L. Smith, formerly vice-president and director of sales, has been made executive vice-president and director of sales. Thomas S. Smith has been appointed vice-president. Mr. Barnes joined the Telsmith organization in 1919 and subsequently became Chicago district manager, New York district manager, sales manager, and executive vice-president. Other officers include Harvey H. Rumpel, vice-president and manager of works; Alexander L. Munro, secretary and chief engineer; Edgar P. Farrill, assistant secretary; and William G. Simerson, assistant treasurer.

The Ludlow-Saylor Wire Co., St. Louis, Mo., announces that Frank B. Ungar, who for many years has attended the conventions of the National Sand and Gravel Association and the National Crushed Stone Association, has retired as sales manager after 52 years of service with the company.

Link-Belt Co., Chicago, Ill., has been judged as having the best annual report of the material handling equipment category by the board of judges in the *Financial World* Survey of Annual Reports. The bronze "Oscar of Industry" trophy was presented to George P. Torrence, president of the company, at the recent annual awards banquet.

Lincoln Engineering Co., St. Louis, Mo., announces the election of L. L. Meikle as president of the Lincoln Engineering Co. of California. He succeeds C. Homer Redd, who will continue to serve the company in an advisory capacity. Mr. Meikle will supervise the entire West Coast division, comprising the states of Arizona, California, Nevada, Oregon, Washington and western Idaho.

Olin Industries, Inc., East Alton, Ill., announces that Dr. Robert A. Cooley, Howard L. Wolsted and John M. Mandas have been assigned to the

explosives department of the research and development division. Dr. Cooley was formerly supervisor of the propellants section at the Naval Ordnance Test Station. Mr. Wolsted served as production supervisor at Monsanto Chemical Co.'s J. F. Queeny plant in St. Louis, Mo. Mr. Mandas received his B.S. in chemistry at St. Ambrose College. He gained his M.S. at Iowa State College where he specialized in the study of analytical methods.

St. Regis Paper Co., New York N. Y., has announced that construction has been started on an addition to its multiwall bag plant at Pensacola, Fla. The new capacity is expected to be available for production late in 1952.

Symons Clamp & Mfg. Co., Chicago, Ill., has begun work on the new 30,000 sq. ft. addition adjoining its present factory in Chicago. The building plus the new machinery is expected to increase present production by an estimated 110 percent.

Waukesha Motor Co., Waukesha, Wis., has announced the appointment of Harry J. Lemmer as advertising manager. Mr. Lemmer joined the organization in 1942, following a number of years as Chicago passenger traffic representative for the Union Pacific railroad and service in the passenger and promotion departments of the Illinois Central and Chicago Great Western railroads. During the war Mr. Lemmer acted as technical information manager and supervised the publication of technical manuals ordered by the armed services using Waukesha engines and power units all over the world. He has been assistant advertising manager since 1946.

Harry J. Lemmer

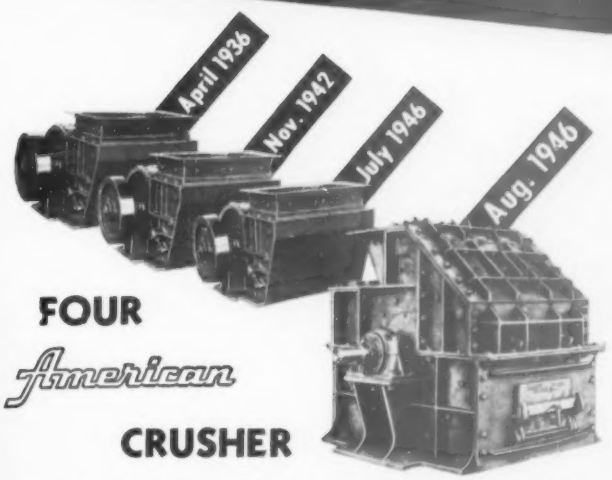
The White Motor Co., Cleveland, Ohio, has announced the appointment of Roderick H. Clarke as sales manager of the company's Sterling division, with headquarters in Milwaukee.

Lincoln Electric Co., Cleveland, Ohio, has recently moved to a new plant. The company's headquarters are now at 22801 St. Clair Ave., Cleveland.

H. K. Porter Co., Inc., Pittsburgh, Penn., has acquired the Buffalo Steel Co., Tonawanda, N. Y., producer of light steel products. With the acquisition of this company, Porter officials report a total steel production exceeding 200,000 tons.

Hyster Co., Portland, Ore., has appointed Freeman & Sons, Inc., Miami, Fla., as distributors in the counties of Dade, Monroe, Collier, Broward, Palm Beach, Hendry, Lee, Glades, Martin, Okeechobee, Saint Lucie, Indian River and part of Charlotte.

More "CRUSHING" FACTS ON American CRUSHER PERFORMANCE



FOUR American CRUSHER

INSTALLATIONS BY TEXAS QUARRY PROVE THAT *Americans* REALLY PAY OFF!

Four in a row! Yes, since 1936 this southwestern quarry has turned to American each time its operations called for expanded production.

To date, nearly five million tons of limestone have been reduced by these four crushers. Here are the individual performance records:

TYPE	30-40	30-40	30-40	AC-8-4
AGE	14½ yrs.	9 yrs.	5½ yrs.	5½ yrs.
TOTAL TONNAGE	2,175,000	1,350,000	605,000	2,337,500

Each crusher had to pay off in tangible productivity to justify three repeat orders. What better proof of American Crusher dependability, efficiency and economy? Let American investigate *your* crushing needs. It will make dollars and sense.

WRITE for "Better Stone Crushing" Bulletin.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1245 MACKLIND AVENUE • ST. LOUIS 10, MISSOURI

10 TONS PER HOUR
OF PERLITE ORE.....SIZED THROUGH
A 4-DECK
SWECO
SEPARATOR

That's the story of the SWECO Separator installed at Napa Perlite, St. Helena, California. It was chosen for the accurate sizing of perlite ore after exhaustive tests. Through months of service the SWECO Separator has proven itself in this installation by continuously dependable performance in sizing at a rate considerably above the capacity of any other known screen device of comparable screen area. Write for complete details of the SWECO Separator; it can help solve your screening problems.

SWECO

The **SWECO SEPARATOR**

Division of **SOUTHWESTERN ENGINEERING COMPANY**
4800 SANTA FE AVENUE • LOS ANGELES 58, CALIFORNIA

MORE TONS
PER MAN HOUR!
LONGER SERVICE
WITHOUT SHUTDOWNS!

when you use . . .

CLEVELAND
WIRE SCREENS

- Longer Productive Service
- Reduction of "Breaks" in Screen
- Toughness and Ductility
- Rigid Accuracy of Openings Maintained Continuously
- Built and Designed with Experienced "Know How"

Cleveland Vibrating Screen Sections are *tough*, but ductile . . . accurately woven of production-tempered abrasion-resistant steel. *Increase your tonnage, reduce down time*, by installing *longer-life* Cleveland Wire Screens!

Write today for Bulletin No. 6

THE CLEVELAND WIRE CLOTH & MFG. CO.
3576 E. 78th STREET • CLEVELAND 5, OHIO

John A. Roebling's Sons Co., Trenton, N. J., has announced that J. Peter Brehm has been named district sales representative in the San Francisco area for the company's woven wire fabrics division. Prior to this appointment, he was a member of the division's Los Angeles sales force.

Johns-Manville Corp., New York, N. Y., announces that Karl V. Lindell has been appointed vice-president of Canadian Johns-Manville Co., Ltd., and general manager of the Asbestos Fibre Division.

Caterpillar Tractor Co., Peoria, Ill., has announced the death of Raymond Charles Force, first president of the company and a member of the board of directors, in Oakland, Calif. He was 71 years old. Mr. Force had served as president from 1925 to 1930, then became chairman of the executive committee and a director. He became associated with the tractor business in 1919, when he was named vice-president and secretary-treasurer of the C. L. Best Tractor Co., one of Caterpillar's two predecessor companies.

Twin Disc Clutch Co., Racine, Wis., has re-elected the following officers: P. H. Batten, chairman of the board; John H. Batten, president; Soren Sorenson, vice-president of manufacturing; and N. F. Adamson, vice-president of sales. G. L. Shuman has been appointed vice-president of finance and secretary; R. G. DeLong, vice-president, hydraulic division; R. T. Howell, treasurer and assistant secretary; R. T. Rehwald, assistant secretary and comptroller, hydraulic division; and W. F. Shurts, director of engineering.

Boston Woven Hose & Rubber Co., Cambridge, Mass., plans to build a $1,000,000 rubber reclamation plant which is expected to be completed the latter part of 1952. Using an air separation process developed by company engineers, the new plant will help to conserve scarce rubber supplies by extracting all usable material from scrap auto tires and other waste rubber.

Mack Trucks, Inc., New York, N. Y., has announced the appointment of E. M. Young as manager of the Charlotte, N. C., district. Mr. Young, who has been assistant to the manager of the Southern division, Atlanta, Ga., since 1944, joined the company in 1924 as an assistant cashier at Knoxville, Tenn.

The Jeffrey Mfg. Co., Columbus, Ohio, announces that Lincoln Kilbourne has been appointed manager of sales, conveyor division. He was formerly manager of sales, products engineering division, and will be succeeded in this position by C. G. Hawley, district manager of the Jacksonville office. L. Cole, sales engineer in the Columbus territory, has been named to succeed Mr. Hawley as district manager at Jacksonville. Paul Lawall, formerly district manager of

the New York office, has been appointed manager of sales, general engineering division, Columbus, and R. W. Sweitzer, district manager of the Philadelphia office, will succeed him in New York. W. K. Myers, district manager in Boston, has been placed in charge of the Philadelphia office, and Paul Hendry assumes the position of district manager at Boston. Dan Knies and A. W. Lemmon have been named consultant sales engineers of the conveyor division in Columbus.

Detroit Diesel Engine Div. of General Motors Corp., Detroit, Mich., has made available to diesel owners and operators on-the-job training in the operation and maintenance of diesel engines. The newest addition to the fleet of mobile training schools has been sent to Canada, and another to Mexico, making a total of nine units being operated by the company. According to T. L. Guarniere, service training director, the course is open to diesel engine owners and operators upon application to Detroit Diesel's distributors and dealers and GMC truck dealers. The course offers practical knowledge and proper servicing techniques, and is designed to help owners and operators get maximum efficiency out of their units. It also keeps them up to date on the latest maintenance and operating procedures.

Yale & Towne Mfg. Co., Philadelphia, Penn., has appointed the Baker Equipment Engineering Co., with offices in Charleston, Huntington, Bluefield and Clarksburg, W. Va., as representative in the Charleston, W. Va., territory.

General Electric Co., Schenectady, N. Y., has announced formation of six new operating divisions and personnel: turbine division, Schenectady, with Glenn B. Warren as general manager; motor and generator division, Schenectady, with James M. Crawford as general manager; transformer and allied products division, Pittsfield, Mass., with Francis E. Fairman, Jr., as general manager; measurements and industrial products division, Lynn, Mass., with Harold E. Strang as general manager; switchgear and control division, Philadelphia, with George E. Burens as general manager; and component products division, Fort Wayne, Ind., with William C. Wichman as general manager.

The Baker-Raulang Co., Cleveland, Ohio, has announced election of the following members to the board of directors: Joseph Joiner, Jr., vice-president, Maritime Petroleum Corp., New York, N. Y.; A. Douglass Hall, financial vice-president, The Diamond Match Co., New York, N. Y.; George Miller, president, Strong Cobb & Co., Cleveland, Ohio; Wesley A. Stanger, Jr., partner, Riter & Co., New York, N. Y., and Robert H. Davies, vice-president, The Baker-Raulang Co., Cleveland, Ohio. They replace S. Livingston Mather, R. C. Norton, Lau-

YOU CAN DEPEND ON

TY-ROCK SCREENS

BALANCED RUGGED

4' x 12', two surface
Type F-600 Ty-Rock Screen

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

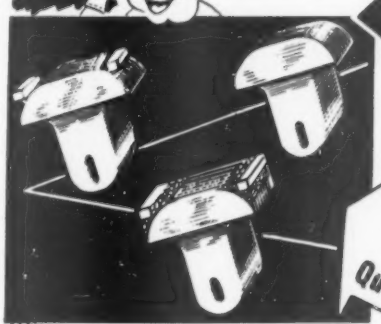
It's No Secret Practically everybody in the field knows . . .

MANGANAL

U.S. Patents 1,876,738—1,947,167—2,021,945

11%-13½% MANGANESE-NICKEL STEEL
APPLICATOR BARS AND WELDING ELECTRODES
are used to . . .

REBUILD WORN HAMMERMILL HAMMERS Quickly and More Economically!



- MANGANAL usually outlasts new hammers.
- MANGANAL practically eliminates build-up time.
- MANGANAL is the toughest steel known — thrives under impact and abrasion.
- MANGANAL workhardens to 550 Brinell.
- MANGANAL has a tensile strength of up to 150,000 p.s.i.

REDUCE COSTS STILL MORE
. . . by using a single pass of SEACO hard-surfacing electrodes. It allows the steel to workharden before wear hits it

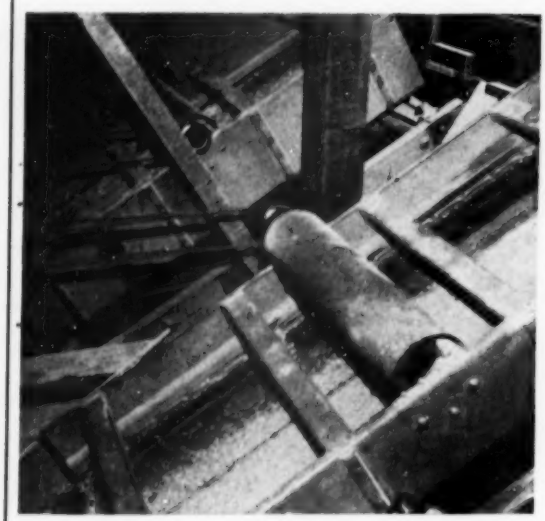
FREE Helpful literature on how to reduce costs on repairs of Quarry, Mining and Contractors equipment.

NAME OF NEAREST DISTRIBUTOR ON REQUEST

Send for catalog and price list.

STULZ-SICKLES CO. SOLE PRODUCERS 93 N. J. Railroad Ave. Newark 5, New Jersey

Get Off To A Good Start This Spring With Universals



Day after day Universal Screens are giving trouble-free service in hundreds of Plants throughout the Country.

They're simple to operate, easy on the budget, but above all, they're *dependable!*

When you're making that proposed change-over this Spring, standardize your screening plant with UNIVERSALS!

Write today for catalog No. 109 on Screens and Screening.

UNIVERSAL VIBRATING *SCREEN CO.*

RACINE — WISCONSIN

EVANSTEEL

***Super Strength* Parts**

are "tops" for resisting

SHOCK • WEAR • ABRASION • BREAKAGE

← EVANSTEEL Heat-Treated Hammers have proved far superior to any other material for pulverizing purposes.

EVANSTEEL Dipper Teeth give extra long service even in digging the toughest material. →

EVANSTEEL Pug Mill Knives ← are highly wear resistant, yet not brittle.

EVANSTEEL Wire Rope Sockets have had no recorded service failure in 40 → years.

For high-strength parts . . . for an *extra* margin of safety . . . for weight-saving sections . . . use dependable EVANSTEEL. This chrome-nickel alloy has a tensile strength after annealing that averages up to 60% greater than ordinary carbon steel.

Write for EVANSTEEL Bulletin

CHICAGO STEEL FOUNDRY CO.

Kedzie Ave. & 37th St., Chicago 32, Ill.

Makers of Alloy Steel for Over 40 Years

rence H. Norton, Irving C. Bolton and Clarence M. Taylor who resigned. William A. Bauer of Hemphill, Noyes, Graham, Parsons & Co., was elected chairman of the board of directors.

Arkell & Smith, New York, N. Y., has announced the election of Ernie E. Brown as vice-president of the company.

Dodge Mfg. Corp., Mishawaka, Ind., announces that John A. Rozos has been appointed director of exports.

Cummins Engine Co., Inc., Columbus, Ind., has appointed R. A. D'Amour as assistant regional manager of the Washington, D. C. region, of which John W. Post is regional manager. G. W. Plondke has been named assistant regional manager of the central region, with offices in Chicago. Fred W. Hartmann is manager of the Central region.

International Paper Co., New York, N. Y., announces the resignation of Malcolm G. Chace as a director of the company and the election of Malcolm G. Chace, Jr., as a member of the board to succeed his father.

SKF Industries, Inc., Philadelphia, Penn., has announced the election of R. Robert Zisette, Gunnar Palmgren, Eric C. Brodin and Karl Kesselring as vice-presidents. Mr. Zisette will be in charge of sales, advertising and market research; Mr. Brodin, manufacturing development; Mr. Palmgren, engineering and research; and Mr. Kesselring, production.

Bemis Bro. Bag Co., St. Louis, Mo., announces that its employe magazine, *Bemistory*, has received one of three Awards of Excellence in the magazine division of the annual competition of the Society of Associated Industrial Editors.

Koehring Co., Milwaukee, Wis., has appointed A. F. Deaney Co., Indianapolis, Ind., as representative in the State of Indiana with the exception of six counties in the northwest corner and six border counties in the southeast.

Atlas Powder Co., Wilmington, Del., announces the appointment of James A. Gilruth as manager of the advertising and sales promotion division.

Baker Industrial Truck Div., The Baker-Raulang Co., Cleveland, Ohio, has appointed W. T. Billard, Inc., Los Angeles, Calif., as sales representative in Southern California and Arizona.

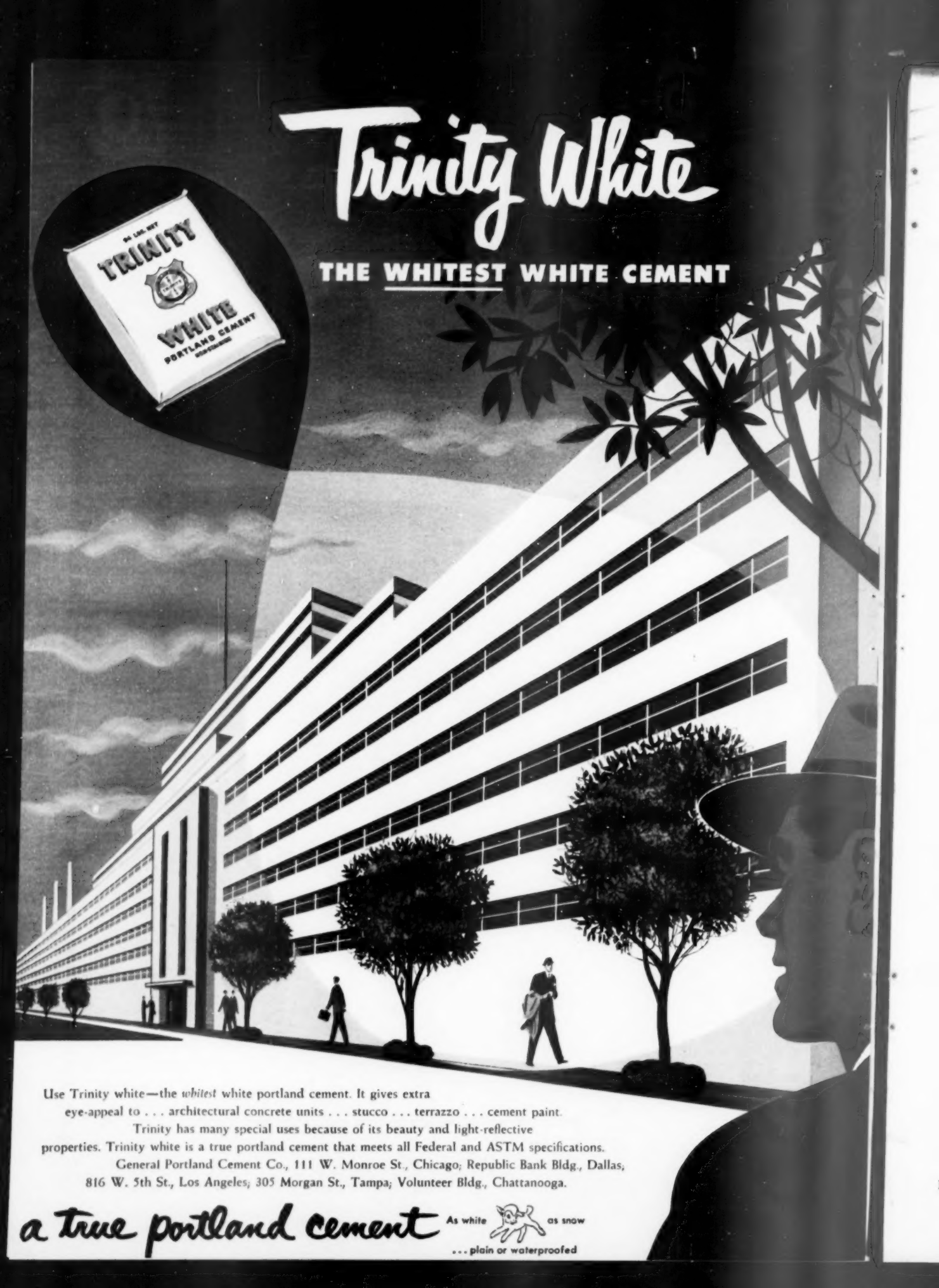
Allegheny Ludlum Steel Corp., Pittsburgh, Penn., announces the appointment of John E. Groves as director of industrial relations and Ralph L. Ostrander as manager of labor relations. Mr. Groves has been manager of industrial relations of the New Holland machine division of Sperry Corp. for the past three years. Mr. Ostrander, who joined the company in 1945, recently served as acting head of the industrial relations department. Both men will make their headquarters at the general offices in Brackenridge, Penn.

CONCRETE PRODUCTS

A SECTION OF ROCK PRODUCTS

CONCRETE UNITS · READY-MIXED CONCRETE

Diesel-powered ready-mixed concrete plant



Use Trinity white—the *whitest* white portland cement. It gives extra eye-appeal to . . . architectural concrete units . . . stucco . . . terrazzo . . . cement paint. Trinity has many special uses because of its beauty and light-reflective properties. Trinity white is a true portland cement that meets all Federal and ASTM specifications.

General Portland Cement Co., 111 W. Monroe St., Chicago; Republic Bank Bldg., Dallas; 816 W. 5th St., Los Angeles; 305 Morgan St., Tampa; Volunteer Bldg., Chattanooga.

a true portland cement As white as snow . . . plain or waterproofed

INDUSTRY NEWS

Steel and Wire Mesh Controls

AMERICAN CONCRETE PIPE Association, in a letter to its membership, summarized, as follows, the latest developments in government regulations pertaining to the requirements and use of steel and welded wire mesh, as affecting the industry:

1. Welded wire mesh, as of January 1, 1952, became a controlled material, rather than an A or B product. The new order supersedes CMP-Regulation No. 1, as amended November 23, 1951.

2. Imported steel is also a controlled material, but it is not charged to the consumer's allotment. Its use must conform to the provisions of the "Buy America" Act, which generally are not too difficult to comply with.

3. To transfer controlled steel which, for one reason or another, the consumer will not use, it is necessary to have the new owner surrender to the old owner an authorized controlled material order.

4. It is advisable to place steel orders promptly with the mills for all that is permitted. A producer is permitted to place 50 percent of his advance allotment, plus 40 percent of his allotment. For example: a man's total allotment for April-May-June might be 600 tons. He can order 50 percent of 300, or 150 tons for April and the same for May. When his allotment arrives, he can place 40 percent of 300 or 120 tons for April and 120 tons for May, leaving only 60 tons to be placed for June delivery when placement of orders is most difficult.

5. Steel producers may accept any authorized controlled materials order without regard to the date of receipt of such order. They are not required to provide for A, B, C or E orders by holding books open or by ousting orders already accepted with lower priorities. If order books are filled, they need not accept A, B, C or E orders.

Airfield Pavements

THE U. S. NAVAL Civil Engineering Research and Evaluation Laboratory of the Bureau of Yards and Docks, will sponsor a symposium on "Airfield Pavements for Jet Aircraft," April 17-18, 1952, at Port Hueneme, Calif. The purpose of the symposium is to encourage and facilitate the interchange of information and ideas among various groups engaged in research aimed toward the design or modernizing of airfield pavements for withstanding the effects of jet-powered aircraft.

A.C.I. Convention

AMERICAN CONCRETE INSTITUTE will hold its 1952 convention at the Netherland Plaza hotel, Cincinnati, Ohio, February 26-28. Emphasis at this meeting will be placed on economy in design and construction and on good concreting practice to produce more durable structures.

The three-day program will include sessions on prestressed concrete; durability and curing; ultimate load design; materials and properties; general design problems; construction; a panel discussion of problems on small concrete jobs; and the annual open session on concrete and cement research.

Two papers will be presented on prestressed concrete design and construction: the first will report economic comparisons for 260 different designs for conventional and prestressed concrete reservoirs; the second will review the design of a prestressed concrete bridge and the construction problems encountered in assemblying and prestressing the precast units.

Five papers are to be presented on the durability of concrete. The important field of concrete railroad structures will be reviewed by representatives of two major railways; durability in pavements and hydraulic structures will also be discussed. A round-table discussion on curing will point up requirements for pavements, structural concrete, mass concrete and canal linings, in addition to the fundamental principles of curing and the action of various curing agents.

Five other papers, summarizing research programs on ultimate load design, will demonstrate the practical application of ultimate load theories to the design of sections and discuss load factors in this type of design.

In the design session, field practice in lightweight concrete, economical design of concrete beams, developments in reinforcing steel and concepts of safety, and the analysis of skewed rigid frames will be reported. In the materials and properties session, the thermal expansion of aggregates, effects of temperature changes on concrete as influenced by aggregates, calcium chloride in concrete, creep of concrete, and the use of fly ash to reduce cement-aggregate expansion, will be among the subjects discussed.

The construction session will include papers on applications of vacuum concrete, concrete temperature control in mass concrete, small building construction, and insulation of forms to protect new concrete from freezing. A movie will show a machine method of lining pipe with concrete.

Cover Picture

ONE OF FEW ready-mixed concrete operations to use a diesel-electric plant to supply electric power is plant of S. White and Son, Stroudsburg, Penn. A Caterpillar D318 diesel electric set is used.

W. E. ANDERSON SONS CO., Columbus, Ohio, presented service awards to 26 employes at a banquet held recently in celebration of the company's 29th anniversary. The company operates six concrete batching plants, three blacktop plants and a fleet of 37 concrete mixer trucks and 23 dump trucks.

PIKES PEAK CONCRETE PRODUCTS Co., Colorado Springs, Colo., has been purchased by E. W. Link and C. J. Indermuehle. Former owner was W. H. Engholm. The plant produces pumice block, concrete block, incinerators and other concrete building materials.

WORTHCRETE CO., Fort Worth, Texas, is now manufacturing precast concrete joists, to architects' and builders' specifications, as a means to relieve the shortage of steel for commercial and residential buildings. No priority is needed by the builder for these joists since Worthcrete Co. issues its own priority for the reinforcing steel used in the joists, according to J. Weldon White, general manager. Worthcrete Co., a division of Texcrete Co., also handles Texcrete Haydite block, concrete block and other building materials.

IVY H. SMITH CO., Jacksonville, Fla., an affiliate of Sherman Concrete Pile Co., also of Jacksonville, has been granted a $300,000 loan by the Reconstruction Finance Corp., for construction of a plant to manufacture welded wire mesh for concrete reinforcement. Part of the Smith company's production (1000 tons of mesh per month) will be used by Sherman Concrete Pile Co. in its production of concrete pipe.

J. E. EVANS CONCRETE PRODUCTS, INC., Shelbyville, Ind., is adding a 40- x 70-ft. building to its plant for the production of concrete lintels, used in lieu of steel over doorways, windows, etc. The reinforced concrete lintels are made in lengths up to 16 ft. A company official stated that heavy demand by builders and contractors prompted the expansion plans.

THE SEABOARD CONSTRUCTION CO., Brunswick, Ga., recently purchased the Glynn Construction Co., also of Brunswick. The Glynn company had been in operation since 1945 and had recently installed equipment for the manufacture of concrete drain tile, steps and septic tanks. Other facilities include six mixer trucks.

READY MIXED CONCRETE, a subsidiary of Skinner and Ruddock Contractors, has begun operations at its new plant at Charleston, S. C. Specializing in ready-mixed concrete, building supplies and rental equipment, the concern will service contractors and builders in the Charleston area. Emil Sodke, who has been in the building material business for 26 years, has been named manager of the new plant.

FOLLOW

CHAIN BELT REX COMPANY

MOTO-MIXERS

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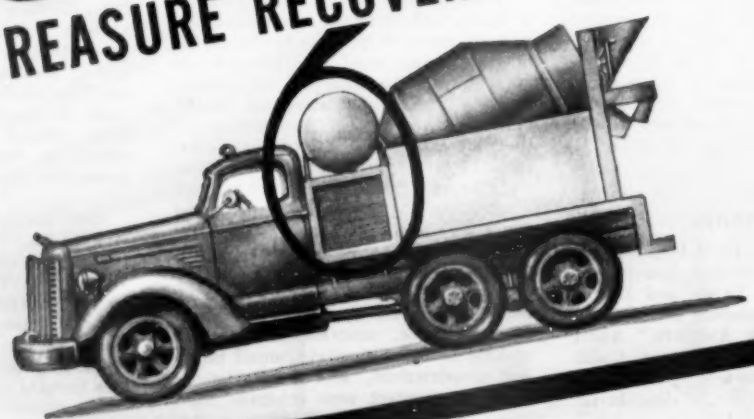
HIDDEN TREASURE RECOVERY = BIGGER PAYLOADS



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TO USE "LOCOMOTIVE-TYPE" DRUM TRACK DESIGNED with track shrunk onto lugs on the drum. FIRST to eliminate welded drum tracks . . . to eliminate track cracking and breaking away.

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NATURALLY when the art of truck mixer design and production progresses to even greater developments permitting LOWER WEIGHT, LOWER MAINTENANCE, LESS LOST OPERATING TIME, LOWER OPERATING COSTS, Rex will again be FIRST to offer FIELD-PROVED machines of higher efficiency.

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HERE'S WHY THEY ASK FOR 'INCOR':

Gotham Cheers!

10 DAYS SAVED IN REPAVING KEY SECTIONS OF HENRY HUDSON PARKWAY

● Repaving this key section of Henry Hudson Parkway's northbound lane illustrates how good job planning minimizes traffic interference. Using 'INCOR' AIR-ENTRAINING 24-HOUR CEMENT for the dual advantage of increased workability and durability, plus dependable 24-hour service strength, heavy traffic was maintained through the job at all times. And the handsome new 'Incor' roadway was in full use ten days ahead of schedule! Good example of modern efficiency in highway building and ready-mix service, as well as of this clear-cut fact:

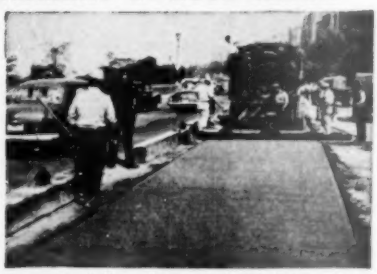
When you want to beat a record, without sacrificing quality, you can't beat 'Incor'*, America's FIRST High-early-strength Air-entraining Portland Cement.

*Reg. U. S. Pat. Off.

ANOTHER EXAMPLE OF DUAL ADVANTAGE OF 'INCOR' AIR-ENTRAINING 24-HOUR CEMENT

Traffic used 3 lanes, while 2" asphalt topping and 3" of old concrete base were dug out and two westerly lanes concreted.

All hands remarked at the cohesive, highly-plastic quality of the 3½" slump 'Incor' air-entrained concrete.



Finishing followed closely behind the mixer—highly-plastic 'Incor' mix expedited placing and finishing.

The first two lanes were quickly opened to traffic, as work went ahead at top speed on the next two lanes.

Completed 10 days ahead of time—result of paving know-how, on-time ready-mix service, and typical 'Incor' performance.

HENRY HUDSON PARKWAY REPAVING
— between 95th and 98th Streets

Supervision:
DEPARTMENT OF PARKS, CITY OF NEW YORK

Contractor: QUEENS STRUCTURES, INC.;
Woodside, N. Y.

Ready-Mix 'Incor' Air-Entrained Concrete:
COLONIAL SAND & STONE CO., INC.;
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Designed for H-15 loading, this 30-ft. span highway bridge erected in Illinois utilizes prestressed concrete block beam units

Machine-made concrete units assembled and prestressed for 30-ft. span bridge in Illinois

PRESTRESSED BLOCK-BEAM BRIDGE

By E. G. HURST*

TO CONCRETE PRODUCTS manufacturers who are alert for new products or new uses for units which may be produced on high production block machines, a close study of the recent development of structures using prestressed concrete design and concrete block units is recommended. Beams assembled from concrete block, strung like beads on wire cables and then prestressed, are being used for bridges, buildings, and even stadiums.

The prestress technique developed by Bryan and Dozier, consulting engineers, Nashville, Tenn., working in cooperation with Carroll Strohm of Nashville Breeko Block and Tile Co., was first used in the construction of a football stadium for the high school at Fayetteville, Tenn. The stands, with a seating capacity of 1525, were constructed at a cost of $7.65 per seat, less than one-half the cost of reinforced concrete stadiums. Bryan and Dozier also designed and supervised construction of a three-span highway bridge for Madison county, Tenn. Since that time, due to enthusiastic reception of the techniques developed, the firm has built another three-span bridge and has several more in the planning stage, including some which have been approved for construction on federal aid secondary routes.

In Illinois, Hurst-Rosche, consulting engineers of Hillsboro, has completed the first bridge in this area using prestressed concrete block beams. The structure, a 30-ft. span designed for H-15 loading, was designed for J. O. Whitlock, county superintendent, Montgomery county highway department, and built under his supervision. The block units for this bridge, all produced on Besser Super Vibrapacs, were supplied by Peyton's Concrete Products Co., Benton, Ill., and Dura Crete Products, Inc., Muncie, Ind. This structure, of slightly different design than those produced by Bryan and Dozier, used precast hubguards and handrail posts, so that the entire bridge superstructure, with the exception of the metal handrail and the 3-in., cast-in-place, concrete wearing surface, was produced by the block plants.

*Hurst-Rosche, Inc., consulting engineers, Hillsboro, Ill.

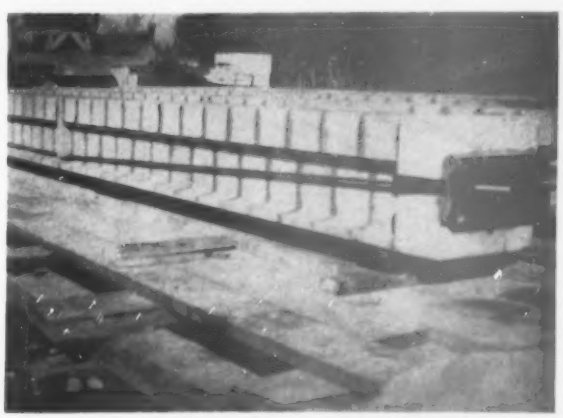
Beam Assembly

Assembly of the beams is simple and can be done with unskilled labor. The block, which must develop a final compressive strength of 3750 p.s.i., are cured for 28 days to eliminate shrinkage. After curing, they are taken to the assembly platform, which can be a level floor or platform, either wood or concrete. Wood cores are slipped in the block cores to prevent mortar from entering. A metal jig is placed over the outside of the block; this jig projects ¼ in. above the top of the block. Mortar is shoveled on the block and struck off. When the jig is removed, a coating of approximately ¼ in. of mortar remains. First an end block is placed, which is a solid unit with two holes for the cables located in the center. Then the regular beam block are placed and tapped into proper dimension. At quarter points, position block are placed, which are also solid units with open eyes which hold the cables 2 in. from the bottom of the beams. This provides the eccentricity required to make the prestressing most effective.

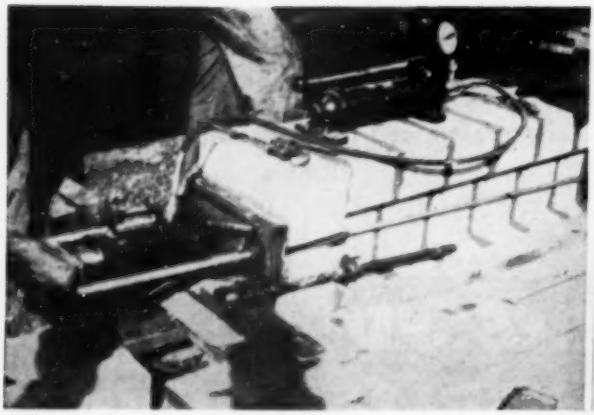
The cables, manufactured by Roebling, consist of seven strands and are 0.60 in. in diameter. The ends of the cables are fitted with a cone-shaped connection made of poured metal around the separated ends of the cable strands, and this cone is threaded for a stud. A 7- x 15- x ¾-in. steel end plate is mortared into position at each end, and the studs are passed through the holes in the plates and fastened with a nut. The end plate is mortared at a slight angle with the end block to assure that the stresses in the cables will be parallel with the strands, which are angled due to the positioning block.

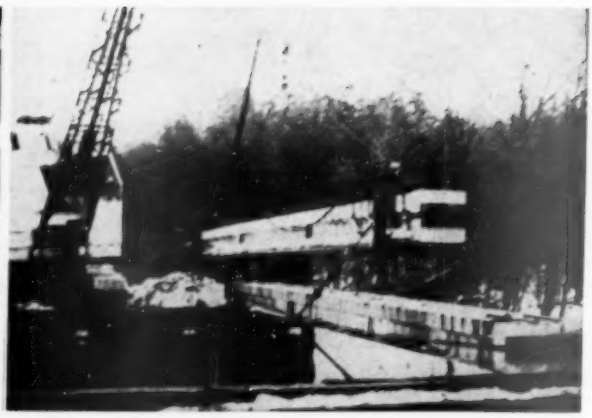
To obtain the prestress, a hydraulic jack is used which has a cylinder separate from the jacking mechanism and is equipped with a gauge. The cylinder of the jack is placed in a rig which consists of a steel plate with two studs spaced the same distance as the studs from the cables. Unions are used to permit the studs of the jacking rig to be joined to the studs of the cables. As tension is placed in the cables by the jack, nuts on the cable studs are tightened to hold the tension when the jack is released.

As soon as the block and end plates are placed, the cables are strung and enough tension applied to extrude the mortar and shorten the beam to proper length; this requires about 5000 lb. total force on each cable. The application of this initial tension must be made with care to assure that the center of the beam is not lifted from the assembly platform; if camber is effected in the beam at this time, it will be permanent.



Beams assembled for prestressing. Note how prestressing cable goes through end block at right and the positioning block at the beam's quarter-point at left





Left: Initial prestress being applied to the beam by a hydraulic jack. Right: Placing the completed beams on the bridge abutments

The following day, the tension in the cables is increased to 20,000 lb. per cable, and with this force, the beams may be moved to a storage yard for curing. After seven days, when the mortar has reached a compressive strength of 2000 p.s.i., the final force of 30,000 lb. per cable is induced; this is a stress of 135,000 p.s.i. in the strands. Ultimate tensile strength of this type of cable is 225,000 p.s.i., so it is apparent that the stresses applied are well within design loading.

On the Illinois bridge, after final tensioning had been applied, six equidistant holes were drilled in each beam to permit threading of transverse cables. After drilling, the beams were transported to the bridge site and placed on the abutments with a ¾-cu. yd. crane. Transverse cables were threaded through the holes provided and tensioned by use of a hand wrench. The beam block were about 2 in. wider at the bottom than at the top and there was, therefore, a 2-in. space between each beam on the top but no aperture at the bottom. Transverse cables were wrapped to prevent bond through these spaces. End and side forms were built, and concrete was then vibrated into the spaces between the beams, care being taken to assure complete encasement of the cables, both longitudinal and transverse. A concrete wearing surface 3 in. deep in the middle, sloped to 2 in. in depth at the sides of the bridge, was placed at the same time, so that the entire floor, beams and wearing surface were formed into a homogeneous mass. Welded wire fabric was placed in the wearing surface. Then the precast hubguard and handrail posts were bolted in place and the metal handrail installed. After the concrete wearing surface had gained a compressive strength of 3750 p.s.i., transverse cables were tensioned to 30,000 lb. each, and the bridge was opened to traffic.

Special block units used in the prestressed beams (l. to r.): end block, positioning block for placement at quarter-points of beam, and regular beam block

Unusual and attractive use found for special precast units was in the construction of this fence

Advantages of Block Beam

The prestressed block bridge has many characteristics which make it an economical, practical type of construction, and one of the most important is the short time required to place the superstructure. On the Illinois bridge, five laborers assembled and stressed five beams per day. There were 18 beams in this bridge, and about 3½ days were needed for beam assembly. Placing of the beams required about ten min. per beam and was done with two laborers and a crane operator. The forming for the floor, which consisted of only a 2-in. strip along the sides of the structure and forms for end walls to protect the beam connections and the end plates, required about eight hr. for a carpenter and helper. The bridge floor was placed in four hr., using ready-mixed concrete, with four laborers, a finisher and a crane operator. The hubguard, handrail post and rail were placed in two days by the crane operator and two laborers. Because this was the first structure of this type the workmen had ever seen, there was lost time which could be eliminated in future construction of this nature. There appears no doubt that a single span structure built by experienced workmen could be completed and opened to traffic in a week, using high early strength concrete for the floor.

In addition to time saved, the prestressed concrete block bridge has other advantages. There is no structural steel requiring future maintenance. There is a gain of about 2-ft. clearance over an I-beam bridge floor, which effects a saving by reducing the height of the abutments and the approach grades. And last, but in these times of shortages certainly not least important, is the small amount of steel required. The major reinforcement is cable, of which there is ample supply. The only structural steel required is in the end plates; on recent designs a saddle block is being used which eliminates one end plate by permitting the cable to pass around a circular groove and return to the other end of the beam. Round bars, ¼ in. diameter, are used in the precast hubguard and handrail posts, and 58-lb. welded wire fabric is placed in the wearing surface. For a 30-ft. span bridge with a 22-ft. roadway, the total poundage of steel required is

(Continued on page 176)

Testing laboratory and delivery procedures aid Fischer Lime and Cement Co., Memphis, Tenn., in producing uniform concrete

Fischer Lime and Cement Co.'s ready-mixed concrete plant, Memphis, Tenn., is one of the most modern in the Southeast

Laboratory-Controlled Ready-Mixed Concrete

By L. DAVID MINSK

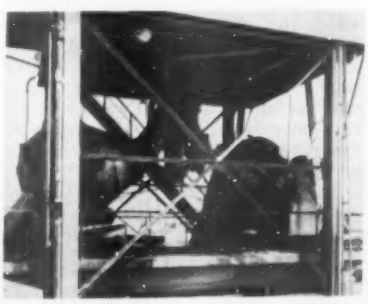
FISCHER LIME AND CEMENT Co. operates in Memphis, Tenn., one of the most modern and progressive ready-mixed concrete plants in the Southeast. In a recent move to guarantee uniform high quality of its product the company completed an arrangement to have all testing done by the Pittsburgh Testing Laboratory. The laboratory has established a Memphis branch in a building at Fischer's ready-mixed concrete plant, though it does not limit testing to that company's business.

The central mixing plant consists of a C. S. Johnson batching plant with two 4-cu. yd. Koehring mixers. The entire plant was originally used on a dam construction project in the West, then shipped to Memphis where Fischer began operating it 3½ years ago. The equipment could be operated completely automatically, but only 12 different mixes could be preset for this. That is, aggregate, cement and water weights could be preset, and merely by pushing a button the operator could start the automatic cycle of weighing, batching and mixer charging. In practice, since one man is needed for operation anyway and since many more than 12 mix designs are specified by customers, batching is by manual control.

Batching

There are six weigh batchers—four aggregate, one cement and one water. Aggregate batchers have 75-cu. yd. hoppers and 4000-lb. scale dials. The cement batcher has a 38-cu. ft. hopper and 3000-lb. dial. Cement feed into the batching hopper is controlled by three electro-pneumatic plug valves, permitting cement to be selected from any of three bin compartments. Water is weighed in a 240-gal. tank and measured with a 2000-lb. dial scale. A 400-gal. storage tank is located near the water batcher as intermediate storage. Hopper gates are controlled by air rams, supplied air by a 350-c.f.m. Chicago Pneumatic compressor.

The operator's station is on the batching level. Before him are the six scale dials and batching controls. In an enclosed space above these are graph paper rolls for automatic recording of batch weights. Orders are transmitted verbally from the dispatcher's office by a public address system.



Although the company seldom uses both mixers simultaneously, they offer the advantage that maintenance can be performed on one mixer while the other continues in operation

When the batching equipment is operated semi-automatically, each batcher discharges in a preset sequence controlled by an electric timer. Electrical interlocks prevent discharge of any batching hopper until the preset weights are reached. The entire batching operation can be completed in less than 20 sec. Normally only one of the twin 4-cu. yd. tilting mixers is used. There is no advantage in using both simultaneously since there is always a slight delay in spotting trucks under the discharge hopper. Two mixers are a definite advantage though, the company feels, for maintenance can be performed on one mixer while peak production is continued with the other. Normal production using 3-min. mixing time is 120 cu. yd. per hr.

Moisture Control

Moisture in the gravel is compensated for in batching by accepting (empirically) that 1 percent is water. Sand moisture content is measured by the Chapman flask method about every two hours, or more often if a change in mix consistency warrants it. A moisture compensating device is incorporated on the sand batching hopper. The adjustable dial (see photograph) when set for the moisture content figure, from 1-10 percent, automatically increases the weight of sand batched and proportionally decreases the amount of water measured.

Standard portland cement only is used, though air-entraining agent (Darex), or calcium chloride or extra cement factor for high early strength provide the means for designing the various mixes. No water is added to truck mixers after they leave the plant unless the job superintendent signs for it at the site. This step, plus the close control afforded by the testing laboratory on the plant premises, have practically eliminated trouble shooting calls and ended "soupy" mix complaints, according to company management.

Storage facilities for cement and aggregates are ample. There is yard storage for 25,000 tons of gravel and 15,000 tons of sand. Four aggregate bins over the batching plant hold a total of 250 cu. yd.; two are for coarse aggregate, one for torpedo sand and

Unloading aggregates, right, from railroad cars through an undertrack hopper. A short stub conveyor feeds the 370-ft. belt conveyor to the batching bins. Aggregates can be discharged to storage, center, by a movable tripper. The reclaiming tunnel conveyor transfers to the main belt at the same point as the undertrack hopper. Aggregates are also delivered by truck

Trucks are kept in top shape by a well-organized maintenance program which includes daily inspection and washing and oil spray

A complete testing laboratory has been set up at the Fischer ready-mixed concrete plant

one for sand. Steam jets are used in the coarse aggregate bins in cold weather.

Aggregates are delivered to the plant by rail or truck. For rail delivery an undertrack hopper and short inclined stub belt conveyor, 32 in. wide x 30 ft. long, are used to feed the 24-in., 370-ft. belt conveyor to the batching bins. The 250-ft. center section of this conveyor crosses the yard storage area, into which aggregates may be discharged by a movable tripper. A 250-ft. reclaiming tunnel with air-operated gates 10 ft. apart houses a 32-in. wide reclaiming belt conveyor, which transfers to the long belt at the same point as does the undertrack conveyor. All belting is Robins.

Cement is stored in a three-compartment 400-bbl. bin in the middle of the batching plant. Two compartments hold 100 bbl. each and the remaining compartment holds 200 bbl. A steel silo 20 ft. in diameter and 40 ft. high alongside the plant holds an additional 2800 bbl. Air agitators are used to facilitate the flow of cement. Cement from rail cars is unloaded into a 10-in. diameter screw conveyor 30 ft. long, which terminates at a bucket elevator 95 ft. 6 in. high for elevation of cement to a distribution head at the rate of 300 bbl. per hr.

Truck Maintenance

Fischer operates 36 company-owned truck agitators, principally Rex, Jaeger and Challenge on Ford, International and Mack trucks. Mixers range from 3-6 cu. yd. ratings as agitators. Trucks are kept in top shape by a well-organized maintenance program which includes inspection as well as washing each day. The company takes great pains to keep its trucks looking clean, which has advertising value, and has built a five-stall wash rack for this purpose. A series of troughs at the rear of the racks traps concrete discharged during drum washout. A light mineral oil is sprayed on the exterior of the trucks after washing.

Ready-mixed concrete is advertised in newspapers at regular intervals. Other merchandising methods Fischer uses are match book advertising, football schedules and maps. The ready-mixed concrete division is only a part of Fischer Lime and Cement Co., which also operates a concrete block and brick plant. The company also does a large volume in wholesale building materials within a 200-mile radius of Memphis. This includes a new branch wholesale warehouse at Paducah, Ky., and a new wholesale branch warehouse now under construction in Jackson, Miss. Fischer Lime and Cement Co. operates a subsidiary company, Fischer Steel Corp., which is one of the most modern steel fabricating concerns in the Southeast.

Personnel

W. N. Fry, Jr. is president of Fischer Lime and Cement Co. and W. S. Walters is president of the subsidiary, Fischer Steel Corp. Lee T. McCourt is chairman of the board of both companies. Personnel of the ready-mixed concrete division includes W. L. Hackney, general superintendent, L. T. Sumner, chief engineer, James E. Bagwell, plant superintendent and C. L. Joachimi, sales promotion manager.

Waterproofing

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, has published a new 32-page book to help dealers in advising customers what to do about improving basements, both new and old. The booklet is entitled "How to Make Basements Dry, Beautiful and Livable." Its contents fall into three sections: (1) how to make an existing damp basement dry, (2) practical ideas for beautifying basements and (3) how to build a basement that will be lastingly dry. Plans and information for basement recreation rooms, playrooms, game rooms and bedrooms are given, including illustrations in four colors.

Below: Setting of the small dial at left to percentage of moisture in sand automatically compensates both sand and water weigh batchers. Right: The plant has six weigh batchers—four aggregates, one cement and one water. The operator's station is on the batching level

Curing and Markets Emphasized by Wisconsin Block Producers

HIGHLIGHTING THE 32ND ANNUAL convention of the Wisconsin Concrete Products Association were talks pointing out the means for expanding the markets for concrete block. Other subjects discussed before the group, meeting in Milwaukee's Plankinton House, January 16-17, were Wisconsin building code requirements for concrete masonry, a method for determining moisture condition of concrete block, steam curing, and current government regulations affecting the industry. In addition, an open forum was held in which manufacturing problems were aired, and an economist presented his views of what is ahead for business in 1952. A banquet held the first evening attracted many producers, who enjoyed the excellent entertainment.

New officers were elected to serve the association for 1952. They are: president, Paul Jensen, Jensen Block Co., Racine; 1st vice-president, Ray Minette, Berthelet Fuel and Supply Co., Milwaukee; 2nd vice-president, Arthur Grube, Sheboygan Brick Co., Sheboygan; secretary (re-elected) A. W. Devos, Devos Block Co., Milwaukee; and treasurer (re-elected) Edwin Bartlett, Jr., Best Block Co., Milwaukee. Directors are Ray Melville, Valley Concrete Products Co., Wisconsin Rapids; Fred Radandt, Fred Radandt & Sons, Manitowoc; Harry Sorenson, Waylite Concrete Masonry Co., Racine; George Andrew, Fond du Lac Concrete Products Co., Fond du Lac; and Herbert Loucks, Madison Silo Co., Madison.

E. W. Dienhart, executive secretary of National Concrete Masonry Association, was on hand to discuss national activities. The association is dividing its activities equally between the technical and promotional aspects, he said. Mr. Dienhart reviewed some of the government regulations and described the successful efforts of N.C.M.A. and the Portland Cement Association to get the Corps of Engineers' approval for concrete masonry after a large number of masonry buildings had developed serious cracks —cracks due, in most cases, to poor design and construction, it was discovered. Through N.C.M.A.'s efforts prestressed products using steel have been declared a B product, according to the secretary.

New products for new markets were ably described by Charles W. Yoder, Portland Cement Association, Milwaukee. The new products are principally prestressed concrete units, which have brought business to concrete products manufacturers where previously they could not compete. As examples of this market, Mr. Yoder described and showed slides of a number of prestressed concrete unit bridges and bleachers. The Madison county, Tenn., bridge was built at a cost of $1.50 per sq. ft., an amazingly low figure, the speaker pointed out. Bleachers, first put up in Fayetteville, Tenn., consisting of 30-ft. beams, were built at a cost of $7.65 a seat. This low price should prove attractive to school boards, Mr. Yoder said, adding that the market for bleachers is tremendous. One out of every five schools needs stadium bleachers. There will also be a large market for bridges on county and secondary roads for the next ten to 15 years, he said, creating much demand for concrete products.

The John R. bridge in Detroit, described by the speaker, uses 8- x 16- x 24-in. precast I-shape units. These were used to make 44-ft. beams with two cables tensioned to 130,000 p.s.i. in two stages. The concrete used developed a compressive strength of 5000 p.s.i.; the bridge design loading was 430 lb. per sq. ft.

Mr. Yoder impressed upon the audience that all the bridges and bleachers described and shown on slides consisted of precast units made on standard block machines, and that any producer could undertake their manufacture.

Masonry Moisture Condition

A relatively new method for determining the moisture condition of concrete block was described by Carl A. Menzel, manager, Housing and Cement Products Bureau, Portland Cement Association, Chicago, Ill. He stressed the importance of obtaining dry block, pointing out that Corps of Engineers' specifications now call for a maximum moisture content of 30 percent at time of delivery.

The speaker described how shrinkage varies with reduction of moisture content. It is desirable for block to be dried, for shrinkage can be minimized by adequate drying before block are placed in a wall. A further advantage of drying, according to Mr. Menzel, is that block do not swell as much following resaturation after they have once been dried. High pressure steam curing, of course, also reduces the tendency to swell.

In the construction of Portland Cement Association's laboratory in Skokie, Ill., and the remodeling of the Chicago headquarters, it was found necessary to dry block on the job. This was accomplished by covering stockpiles of block with tarpaulins and circulating heated air from unit heaters through them. (See ROCK PRODUCTS, November, 1951, page 133, for a more complete description of the method employed.)

Mr. Menzel stated that the required degree of dryness of block depends upon whether they are placed in interior or exterior walls. That is, exterior walls subject to temperature

Left: Officers of Wisconsin Concrete Products Association pose for a picture. Left to right: Herb Loucks, Madison Silo Co., Madison, director; Paul Jensen, Jensen Block Co., Racine, president; George Andrew, Fond du Lac Concrete Products Co., Fond du Lac, director; Harry Sorenson, Waylite Concrete Masonry Co., Racine, director; Ray Minette, Berthelet Fuel and Supply Co., Milwaukee, 1st vice-president; Edwin Bartlett, Jr., Best Block Co., Milwaukee, treasurer; and Art Devos, Devos Block Co., Milwaukee, secretary. Right: An informal discussion by (l. to r.) Ellis Jensen, Janesville Sand and Gravel Co., Janesville; O. Neil Olson, Marquette University; Glenn Moul and A. P. Vander Heyden, both of Vander Heyden, Inc., West Allis

Left: Henry Buchholz, left, Illinois Brick Co., Chicago, Ill., and Paul Bohm, Sr., Concrete Products Co., Mishawaka, Ind., relax between sessions. Center: An informal discussion by (l. to r.) Jesse Besser, Besser Manufacturing Co., Alpena, Mich.; Carl Menzel, Portland Cement Association, one of the program speakers; and Harry Emerson, Lehigh Portland Cement Co., Chicago, Ill. Right: Ludwig Spielvogel, left, Cambria, Wis., and Emil Fehr, Fehr Concrete Pipe Works, Eau Claire, Wis., are caught in deep meditation

changes will require block of lower moisture condition. Mr. Menzel was emphatic in his statement that the proper degree of dryness of block is the second most important quality, second only to strength characteristics.

Because of the tightening specifications, it is important for producers to determine the actual moisture condition of their product. With this in mind, the Portland Cement Association undertook the design of a simple device for obtaining this figure quickly and easily. Mr. Menzel demonstrated the result of his efforts. The device consists of a 12-gal. steel container with a quick-release cover. A small blower to circulate air inside the container and a hygrometer (an instrument to measure humidity) are attached to the cover. To measure the moisture condition of the concrete, a unit is broken into small pieces to expose a large surface, then the pieces are placed in a wire basket. The basket in turn is placed in the container and the cover attached. The electric blower is turned on and final reading in percent relative humidity made in about 20 min.

Mr. Menzel stated that 12 units of this test apparatus have been built, and in cooperation with N.C.M.A. will be loaned to various universities, laboratories and block plants. No further information is planned to be released on the units, Mr. Menzel said, until sufficient data are collected to determine the success of the method.

Wisconsin Code Requirements

P. H. Thern, senior assistant building engineer, Wisconsin Industrial Commission, Madison, answered some recurring questions about state building code requirements for masonry construction. He advised all producers to become familiar with the code, preferably first hand by obtaining a copy of the code book published by the state.

Mr. Thern described two buildings with wall failures that were investigated. Brick veneer with concrete masonry back-up was used in both, and in each case the walls bowed out considerably. It was found that the mortar was at fault rather than the units. Mortars tested on another job showed an extreme variation from the specified 1:1:6 mix (lime, cement, sand) he said. In the future an autoclave test will be required for masonry cements.

The Wisconsin code with regard to cavity wall construction may be changed later, but at present cavity-type wall construction can only be used for non-loadbearing walls with a maximum height of 10 ft. Unit thicknesses have to be 4 in. and 8 in., separated by a 2-2½ in. space. As yet no concerted effort has been made by any group to change the code, he said, adding that the Wisconsin Concrete Products Association might take the lead if the members felt it advisable. A seven-course header rather than a six-course might also be backed as a code change if the association wished, Mr. Thern suggested.

Curing Masonry Units

William J. Shore, Shore Engineering, New York, N. Y., presented a review of five previously published technical papers on curing of concrete. These dealt principally with changes in block size due to various methods of curing, as well as variation in strength due to different means of applying steam for curing.

The first report reviewed was based on work done by Joseph Shideler and Wilbur Chamberlin on early strength of concrete as affected by steam curing temperature (appeared in *Journal of the American Concrete Institute*, December, 1949). Concrete specimens were subjected to various steam temperatures and the resulting strengths measured. Conclusions were that steam curing accelerates early strength, but all steam-cured specimens showed less strength at 28 days than fog curing at 70 deg. F. Optimum temperatures were between 130-165 deg. F. Temperatures of 100-130 deg. F. for three days followed by fog storage gave strengths comparable to natural fog curing. Specimen steam-cured at 165 deg. F. for six hr. to three days showed a strength at 28 days of less than 75 percent of units continuously fog cured. A delay of two to six hr. prior to steam curing produced strengths 15-40 percent higher in 24 hr. than when steaming was begun immediately. Also, temperatures above 165 deg. F. were detrimental to the strength of concrete. In all these experiments, temperatures were raised to test values in 2½ hr.

The results, as Mr. Shore summarized them, indicate that no steam-cured units could ever achieve the strength that might have been obtained had they been cured solely by fog at 70 deg. F. for a period of 28 days. Failure of test specimens to reach full strength was due to the fast rate at which temperatures were brought to test values, he said.

The second paper reviewed was a study of concrete strengths under varying steam conditions, conducted by A. G. A. Saul under the auspices of the research and development division of the Cement and Concrete Association of Great Britain and published in *Magazine of Concrete Research*, March, 1951. Mr. Shore stated the conclusions reached in this report as follows: the most important factor in steam curing at atmospheric pressure is the rise of initial temperatures, reckoned from the time of mixing aggregates; reaching a temperature of 122 deg. F. in two hr. after mixing and not earlier than six hr. to reach 180 deg. F. in the surrounding atmosphere after mixing produced the best results; further heat treatment if continued brings strengths up to and approximately equal to fog curing at 70 deg. F. Higher temperatures and prolonged steaming were said to be costly, to be used only where time is a factor such as caused by limited kiln space. Thus, with slow heat rise rate, steam-cured units will closely approach the strength of continuously fog-cured units.

It was Mr. Shore's opinion that the combination of rate of heat rise and size of cement particles have an important bearing on the strengths. He based this on the fact that high early cements are not affected by high temperature rise to the same degree as standard portland cement, and that smaller size of cement particles is responsible for this. A rapid temperature rise, the speaker concluded, probably causes a flash set over the entire outer shell of the cement particle, whereas a slow temperature rise would permit the entire particle to become hydrated.

Dimensional change studies in unit masonry, a report published by J. J. Wegner, Jr., division of industrial re-

(Continued on page 176)

PIPE MANUFACTURERS GO TO SCHOOL

THE AMERICAN CONCRETE PIPE Association held its first "school" at the Edgewater Beach Hotel, Chicago, Ill., on November 26-28. The total registration was 115, of which 103 were members of the concrete pipe industry. The school was designed with the idea of giving managers, superintendents and other operating personnel foundation material to aid them in production and sales problems. The registration was considerably higher than expected and it was indicated that the school might become an annual event, since those present seemed well satisfied with what they learned.

At the time of registration, the general procedure was to give each student a number of publications relating to various phases of the concrete pipe industry, including the "Concrete Pipe Manual" prepared by the staff of the American Concrete Pipe Association. In addition, a mimeographed book, containing copies of prepared papers, was supplied to each of those in attendance. This procedure was helpful since many of the classes included highly technical mathematical discussions of such subjects as the "Elements of Hydraulics," "Loads on Concrete Pipe," etc. With the previously prepared papers the students could dig out the salient facts and figures after leaving the classrooms.

The three-day session was opened by E. H. Fox, president of the association, who introduced John G. Hendrickson, research engineer, and Thomas K. Breitfuss, new members of the association's technical staff.

Howard F. Peckworth, managing director of the association, in his introductory remarks, said that the tonnage of concrete pipe for 1950 was 9,025,000 tons, a gain of about 1,000,000 tons in recent years. He estimated that 1951 would show a production of approximately 10,500,000 tons and that the industry would use about 12,000,000 bbl. of cement, or roughly 1/10 of the cement plants' output. He said that there are 170 companies in the American Concrete Pipe Association and that these companies produce 85 percent of all concrete pipe made in the United States. There are about 130 smaller producers, Mr. Peckworth estimated, making a total of 300. Mr. Peckworth said that concrete pipe for airports is an important item and about 95 percent of the pipe for this work stems from defense needs. In the West smaller diameter, non-reinforced concrete pipe for irrigation work is becoming an increasingly important item.

The speaker said that the concrete used in modern pipe is the best in the world, but he did not depreciate the grade of concrete used in years past, and cited instances in San Francisco where cast concrete pipe has been in service for 75 years. He discussed briefly the subject of acid and alkali soils and other water conditions and pointed out the effect of a low pH on clay and other types of pipe. A pH of 5.0 or less was indicated as being the border line.

Mr. Peckworth reported that the trend in concrete pipe manufacture is in the direction of larger diameters and longer lengths and that the limitations as to length are governed by transportation and placing problems. He outlined A.S.T.M. specification tests and pointed out that specifications should never include definitions on how to make the pipe. He closed his remarks with a brief discussion on problems relating to jacking of pipe under highways, railroad grades and similar projects, and said that the largest pipe jacked was in the 108-in. diameter range and the smallest (using water jets) was 12-in. He stated that it is necessary to use at least two hydraulic jacks and that the Navy and a few contractors have 100-ton jacks that can often be borrowed. In this discussion E. F. Bespalow, Choctaw, Inc., said that in the Memphis, Tenn., area 300 lineal ft. of 48-in. pipe had been successfully jacked. It was pointed out that 300 lb. per sq. ft. was about the maximum, due to skin friction.

Monday afternoon, Lewis H. Kessler, professor of sanitary engineering at Northwestern University, discussed "Some Elements of Hydraulics—Their Place in Determining the Flow in Pipes, Culverts and Sewers and the Proper Selection of Size, Slope and Material of Construction." Professor Kessler gave a historical review, starting with theories developed by Galileo, and explained mathematical formulas that are used by hydraulic engineers. His discourse was included in the mimeographed booklet, and consisted of some 15 pages containing highly technical data. Professor Kessler's talk gave the class some good sales arguments to use in combating some unsound claims of salesmen for pipe made of material other than concrete.

The morning session of the second day was under the chairmanship of E. F. Bespalow, Choctaw, Inc., Memphis, Tenn. The meeting was devoted to discussions of manufacturing procedures and methods. The subject "Centrifugal Pipe" was briefly described by J. A. Dunn, president, Hume Pipe of New England, Inc. He pointed out the advantages of pipe made by the Hume process, saying that since it cost more to make pipe by this method his sales were made on a quality basis. He cited figures to show the increased strength of concrete pipe (using comparative amounts of portland cement) when made by the centrifugal process. He stated that: (1) fast bleeding cement was preferable, (2) the mix should be "boney" to a certain degree, and (3) 42-45 percent relatively coarse sand in the mix all added up to a concrete from which the water could be bled efficiently in the centrifuge used. Mr. Dunn showed motion pictures taken at his New England plant that gave details of the Hume process.

C. A. Bluedorn, president, Zeidler Concrete Products Machinery Co., Waterloo, Iowa, discussed the techniques involved in the manufacture of pipe using packerhead machines. El-

The Technical Problems Committee of the association met during the Chicago three-day school: (l. to r.) John H. Bailey (proxy for I. E. Odendahl), Cretex Companies, Inc., Elk River, Minn.; Edwin H. Fox, president of the American Concrete Pipe Association, The Cincinnati Concrete Pipe Co., Reading, Ohio; H. S. Allen, committee chairman, Kansas City, Mo., branch of Lock Joint Pipe Co.; E. F. Bespalow, Choctaw, Inc., Memphis, Tenn.; and Prof. M. G. Spangler, Iowa State College, Ames

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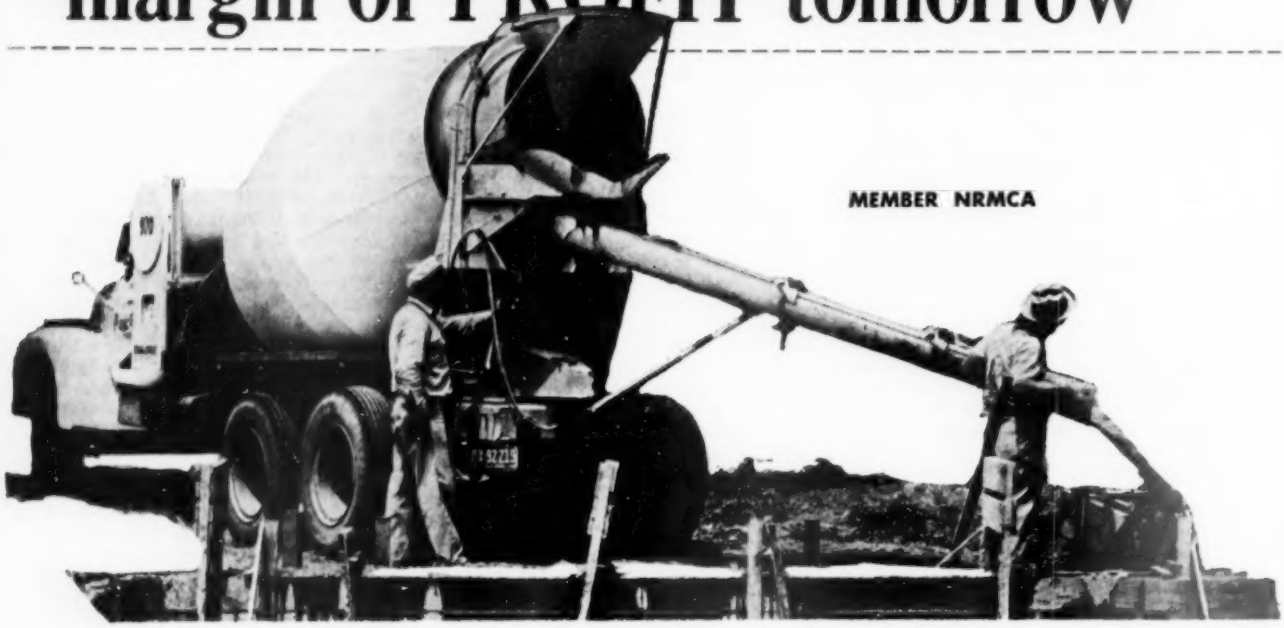

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Left: Association members check the sand used in experimental mixes at the P.C.A. laboratory. Right: The group waiting for the bus after a tour of the Portland Cement Association laboratory in Skokie included Howard F. Peckworth, managing director of A.C.P.A., and E. H. Fox, association president, third and fourth from the left, respectively

mer Leuliette of Universal Concrete Pipe Co., Columbus, Ohio, outlined the manufacture of tamped pipe, and Walden Wren, of the same company, covered the subject of cast concrete pipe. Mr. Leuliette discussed kinds of aggregates to use as well as types of portland cement. He emphasized that the mix should be heavy with gravel or coarser aggregates, and if high early portland cement is used, smaller batches should be mixed, since this type of cement has a high affinity for water and the concrete dries out more rapidly.

The afternoon session was devoted to the general topic of loads and the bedding of concrete pipe. Prof. M. G. Spangler, Iowa State College, Ames, Iowa, discussed "Loads on Concrete Pipe Conduits" followed by another paper on "Bedding and Backfilling Concrete Pipe Conduits." His talks were supplemented by graphs, slides and sound motion pictures, designed to give the students a basis of mechanics relating to loads on concrete pipe and to point out the benefits to be derived from proper bedding. Professor Spangler is a national authority on this subject and has appeared before the association at some of its annual meetings.

The day's meeting closed with a discussion on special designs, given by John G. Hendrickson, research engineer of the association's technical staff. By means of slides, he outlined the results of test work on large diameter pipe in which various designs of steel reinforcing were used. The talk showed possible improvements in design to permit a more efficient use of reinforcing steel.

The morning of the last day was devoted to a trip to the research laboratories of the Portland Cement Association at Skokie, Ill. After a welcome by A. Allen Bates, vice-president for research and development of the P.C.A., all students had an opportunity to see the details of the laboratory and had a brief insight into some of the work being carried out. Later, short talks were given by I. L. Tyler, manager, field research section, in charge of the long range test program. With the aid of slides the speaker outlined progress and methods used and told briefly of some of the results obtained to date. Another P.C.A. speaker was T. C. Powers, manager of the basic research section, who instructed the students in some of the more recent concepts of portland cement pastes and their relation to concrete. Hubert Woods, director of research, concluded the session with a short discourse on the importance of proper curing and brought out the fact that unless proper humidity is maintained during the curing cycle the hydration of cement pastes can stop completely.

After returning to the hotel Prof. Lewis H. Kessler outlined the results of a state-wide survey in Wisconsin, conducted several years ago on the subject of concrete pipe. Copies of the complete report were reprinted by the association and were among the books given to each student at registration time. Professor Kessler described the use of a pH recording device in measuring the acidity and alkalinity of industrial and domestic wastes. Some startling information was obtained by the use of this equipment for it developed that some plants had disgorged waste that was well outside the pH limits prescribed. One case told of having 700 reports, signed by a chemist, which certified that the pH of waste from his plant was well within limits. However, the recording pH meter showed the chemist to be completely at variance with the facts.

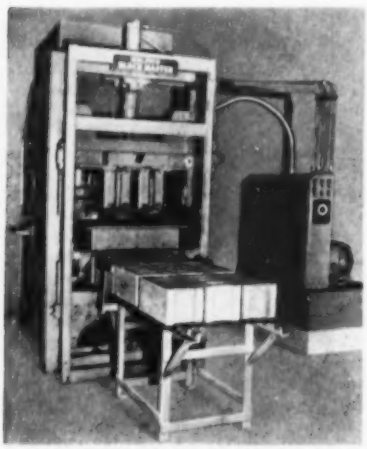
The final instructor was E. F. Bespalow, who demonstrated some methods to convince laymen of the ability of concrete pipe to stand up under uses imposed. He used a semi-technical approach to the subject and clarified some points relating to pH, and to improving the performance of concrete pipe by having proper velocities in sewage lines. He stressed the need for producers to continue manufacturing the best possible concrete pipe because such pipe do withstand severe conditions.

Left: L. E. Wilkinson, left, Hume Pipe of New England, Inc., Swampscott, Mass., and Gerald E. Bull, Salem Concrete Pipe and Products Co., Salem, Ore., pause after one of the school sessions. Center: (l. to r.) One of the program speakers, Carl A. Bluedorn, Zeidler Concrete Products Machinery Co., Waterloo, Iowa, chats with Fred T. Sholes, L. S. Lee and Son, Oaks Corners, N. Y.; and H. H. Davis, Choctaw, Inc., Columbus, Miss. Right: Two Canadian visitors were V. R. Jefferies, left, Jefferies and Sons, Ltd., Calgary, Alta., and G. T. Cruise, British Columbia Concrete Co., Ltd., Vancouver, B. C.

NEW MACHINERY

Automatic Block Machine

MULTIPLEX MACHINERY CORP., Elmore, Ohio, has announced the availability of a completely automatic three-block per cycle machine. Called the Blockmaster No. 3, it is hydraulically-powered by a separate power unit, and the compression action combines pressure, vibration and tamping. Plain pallets are used in making any size or style of block, with any aggregate.



Automatic three-block per cycle machine

Revolving drum-type mixer

Extends Truck Mixer Line

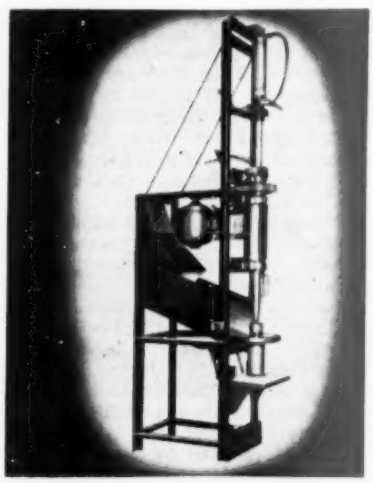
CONCRETE TRANSPORT MIXER CO., 4985 Fyler Ave., St. Louis 9, Mo., has announced an addition to its truck mixer line. The new unit is of the revolving drum type and is offered in conjunction with the Transport and Hi-Lo truck mixers, in a 4½-cu. yd. mixer rating size. This mixer, known as the Rocket, is available with a choice of three different drives; a power take-off drive in conjunction with a hydraulic pump and motor, a straight power take-off mechanical operation, and a separate engine drive. One of the features incorporated into this unit is a hydraulic lift swing chute at the rear of the truck.

Silicone Resin Coating

PRECO CHEMICAL CORP., 40 E. 40th St., New York 16, N. Y., has incorporated the properties of silicone resins into the development of a clear, nonstaining water repellent coating for porous exterior masonry surfaces. Known as Silipruf, this material is applied by brush or spray and, it is claimed, does not change the color or texture of the surface, does not yellow with age and is long lasting. The company reports that Silipruf penetrates as much as ¼ in. into the surface for complete repellency, yet does not prevent the masonry from breathing. This coating can be applied in temperatures down to 15 deg. F.

Concrete Tile Machine

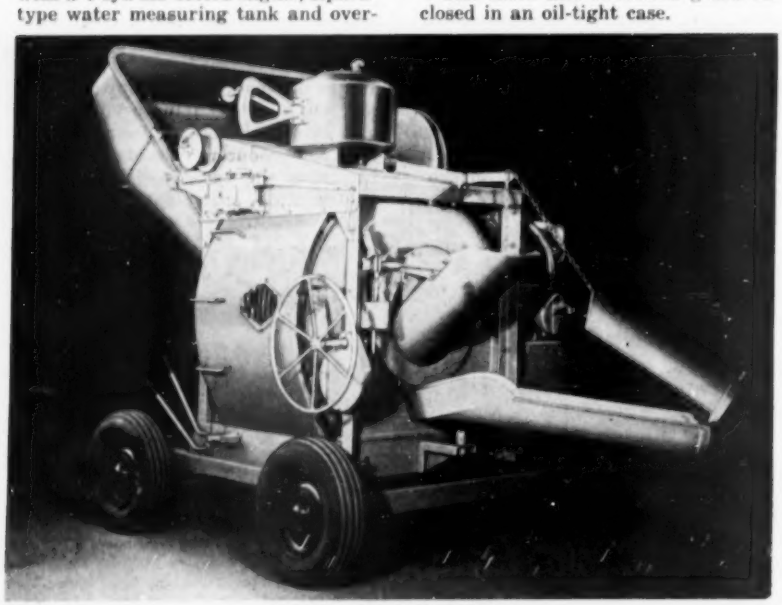
SCHUCH BROS. MACHINE CO., P. O. Box No. 3911, Detroit 27, Mich., has placed on the market a unit for the manufacture of concrete drain tile. Several features are claimed by the company for this machine, designated Tile-O-Matic. These features include a 5-hp., 440- or 230-volt, 3-phase, 60-cycle ball-bearing motor; an electric timer adjustable to 0.1 second; and the manufacture of 450 tile per hr. of 4-, 5-, 6- and 8-in. diameter or any intermediate size.



Concrete drain tile machine

Extends Mixer Line

THE T. L. SMITH CO., Milwaukee, Wis., has announced a ½-cu. yd. "Non-Tilter" mixer, which is equipped with a 4-cyl. air-cooled engine, siphon-type water measuring tank and oversize pneumatic tires. Optional equipment includes a 4-cyl. radiator-cooled engine or electric motor. Other features are channel section welded supporting frame, spring suspension, V-belt drive and reduction gears enclosed in an oil-tight case.



Mixer with ½-cu. yd. capacity

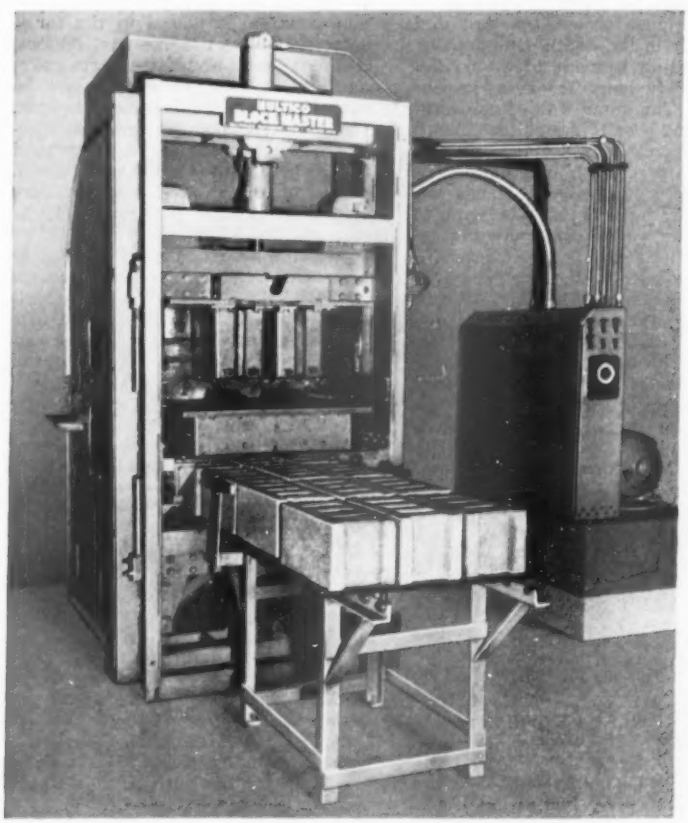
Steam Generator

BOILER ENGINEERING AND SUPPLY CO., Phoenixville, Penn., has in production its "Continental" packaged steam generator, fully automatic and self-contained, and said to be easy to install, efficient in performance and economical to maintain. It is available for use with heavy oil, light oil, gas or a combination, and in sizes from 10 to 500 hp., for 15- to 200-lb. operating pressures. Operation of the burner can be modulated from 35 to 125 percent, providing for periodic oversurge when required. It is reported that, to assure maximum heat transfer and low flue gas temperature, all fuel is burned in the water-surrounded boiler furnace, and the gases pass spirally through 8-in. tubes.

PRODUCTION TESTED!

Blockmaster #3

High Production · Fully Automatic · Hydraulically Powered



The Multico Blockmaster No. 3 is now ready for *your* plant—after three years of production testing in many plants. Producing three blocks per cycle, it is a completely automatic machine, requiring labor only to off-bear block. Hydraulic power from a separate unit provides smooth, quiet operation and serves additional machines in future expansion. The compression action combines pressure, vibration, and tamping, for perfect blocks. Plain pallets are used in making any size or style of block with any aggregate.

Both the Blockmaster No. 3 and the newly modified No. 2 have 50% less moving parts than any other machine in their capacity classes. This means an absolute minimum of maintenance.

Make this proven Blockmaster No. 3 your next machine; call or write for further information.

Multiplex Machinery Corporation has been making concrete production machinery for over 40 years. Our engineers will help you plan your plant expansion. We can show you how Multiplex automatic block machines, mixers, skip hoists, and compartment aggregate bins can make your operations more profitable.

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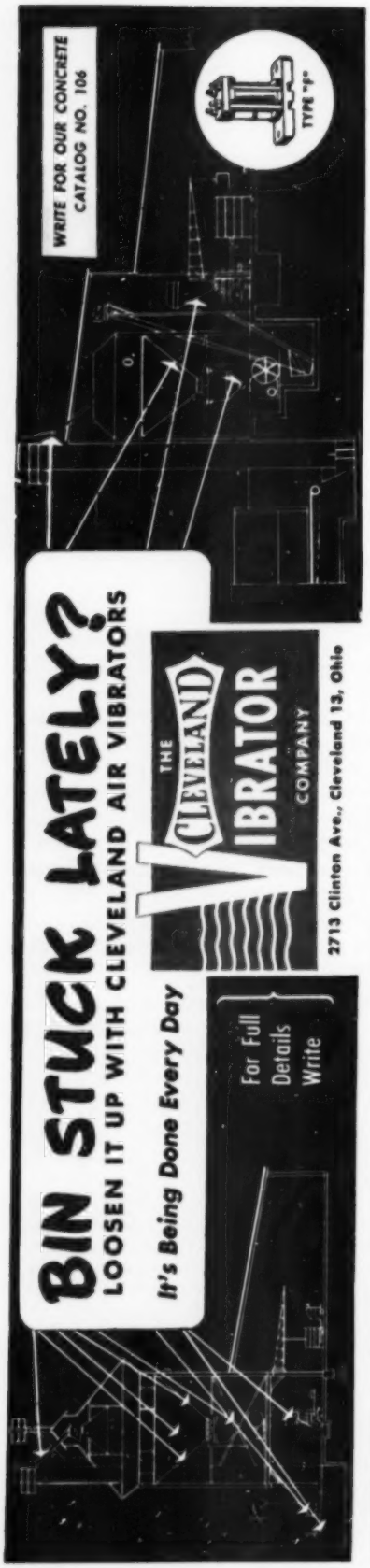
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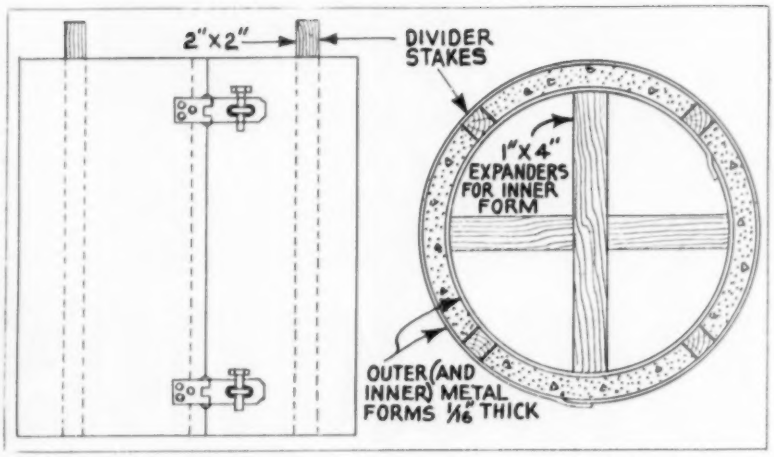


Fig. 1: Inner and outer forms for the precast concrete well casings are made from sheet metal. The 2- x 2-in. divider stakes between forms are removed gradually as the concrete is placed

PRECAST WELL CASINGS

PRECAST CONCRETE WATER WELL casings can be made profitably by using slip-joint forms. These are used extensively in the South. One popular size of casing is made of 32-in. dia. sections, 3 ft. long. Thickness is usually 2 in. The outer wall of the form consists of 15- or 16-gauge sheet metal bent in a circle with a diameter of 32 in., allowing enough overlap at the joint to prevent leakage. Hasps are riveted on the form at the joint to prevent the wall from expanding beyond the desired outside diameter.

The inner form is constructed of similar sheet metal bent in a circle with an outside diameter of 28 in. This wall also overlaps at the joint to prevent leakage (Fig. 1), and is kept expanded to the proper diameter by means of cross braces at each end of the form. One set of such braces is shown.

In use, such forms are placed on a smooth, level floor. After placing the divider stakes and expanders in position, concrete is placed in the form. Some producers use one part cement, two parts sand and three parts gravel; but the mix, of course, can be varied to suit individual requirements. The divider stakes are gradually removed as the concrete is placed and packed between the walls of the form. After hardening, the expanders are removed, allowing the inner wall to collapse.

A clamp such as that illustrated in Fig. 2 is used to insert the casings in well holes. The bail or handle is made of 1-in. round stock. The two-piece hoop can be made from a discarded wagon-tire or other material of the same dimensions. The bolt holes should be oversize or considerably larger than the ½-in. bolts used to fasten the clamp together. It is not necessary to tighten the clamp tightly around the shell, for the weight of the shell tightens the clamp by pulling the hoop pieces together. If one is afraid to risk this procedure in an unusually deep well, the clamp bolts may be tightened with a wrench and loosened after getting the shell to the correct position.

Well casings are let down into a more or less square, oversize hole by means of a hook, rope, ladder and windlass. The first shell is leveled and anchored in firm earth. Additional shells are let down and each is placed on top of another until the well is completely cased.

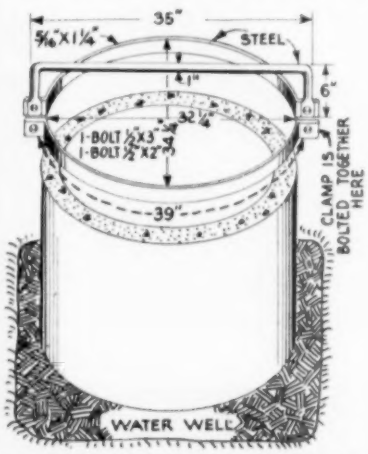


Fig. 2: Details of the clamp used in lowering the well casings into the hole. Dimensions of the concrete shell are: 2 in. thick, 3 ft. long, 28 in. inside diameter

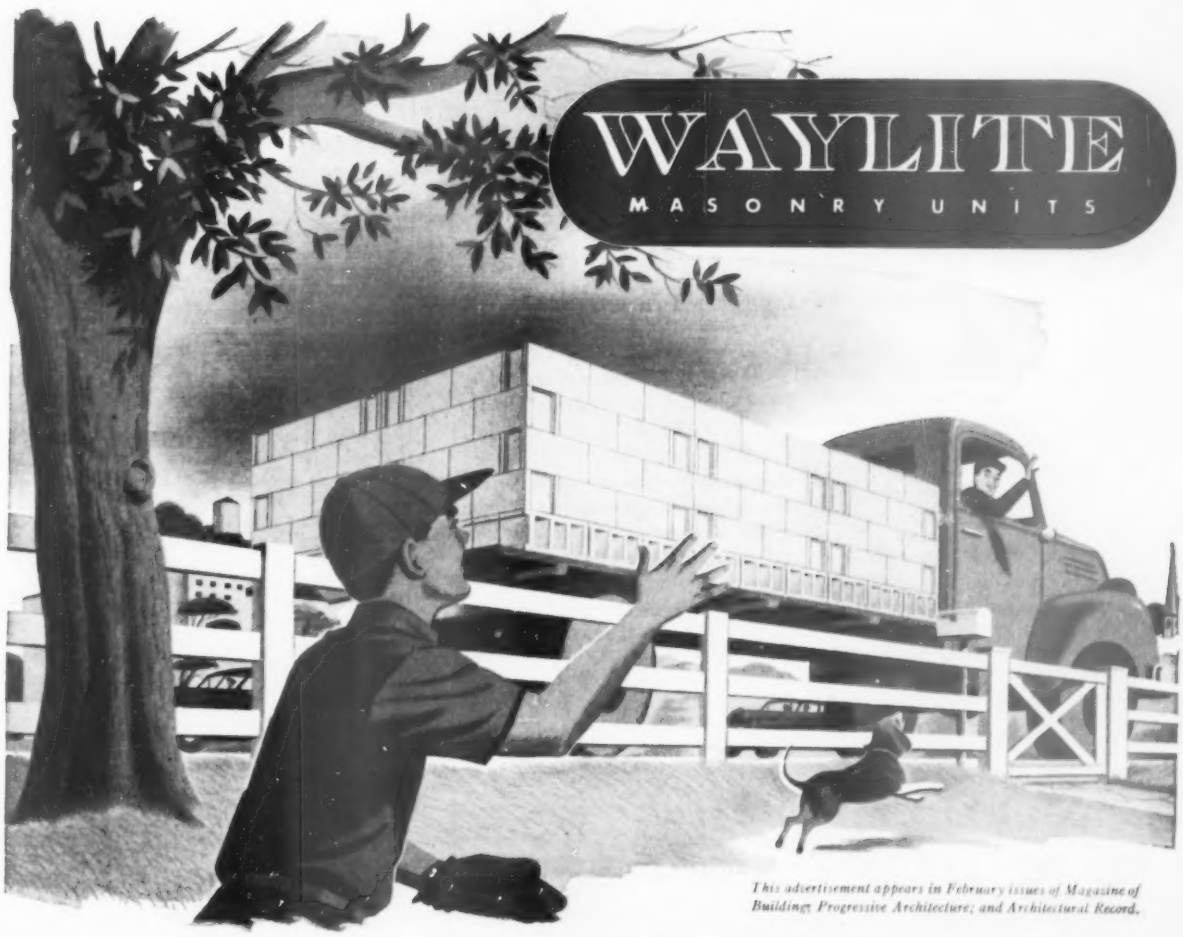
Prestressed Bridge

W. J. STOREN CO., Detroit, Mich., was lowest bidder on a 150-ft. prestressed concrete bridge to be built near Detroit. The bid was for $136,675.90. The bridge will be built on a 45-deg. skew and will carry a 24-ft. roadway over three 48½-ft. spans.

A SALUTE TO THE *Concrete Masonry Industry*

ON ITS FIFTH SUCCESSIVE BILLION-PLUS YEAR

The remarkable record of the Concrete Masonry Industry during the past five years in producing the equivalent of over Six Billion sq. ft. of 8″ Masonry Wall Units has few parallels in building industry history. . . . This production has been equal to about two-thirds of all masonry walls built in the United States during this period. . . . This unprecedented growth of the Concrete Masonry Industry has been the direct result of the quality, utility and economy of concrete masonry walls, and the superior service of progressive locally-owned companies. . . . The Waylite Company is proud to be a part of such an outstanding industry in the construction field, and this seemed to be a good time to say so. . . .



This advertisement appears in February issues of Magazine of Building, Progressive Architecture, and Architectural Record.

the most valuable thing on your truck mixers

The Bureau Rating Plate (1) Assures acceptance of your equipment by architects and engineers, (2) Protects you against obsolescence and departure from quality standards which have won for ready mixed concrete a market now exceeding $500,000,000 a year, (3) Entitles you to call on the unequalled experience of Bureau members to answer your technical or other problems.

(Advertisement below is being read by your best customers in Architectural Record, Engineering News Record, Western Construction and Southwest Builder.)

Walnut Lane Bridge, Philadelphia. First major pre-stressed concrete bridge in the U.S.

Why do you admire this bridge?

The structure you see consists of particles of aggregate and cement, reinforced and, in the girder sections, pre-stressed with steel.

But everything has been so well put together that the eye can no longer separate the design from the material, or its grace from its strength. The whole work is homogeneous.

A like fundamental, never to be overlooked by supervising architects and engineers, is that concrete itself becomes a homogeneous material *only when it has been properly and completely mixed.*

This is why the ready-mixed concrete industry sets exacting standards for mixer design, and certifies to you that truck mixers and agitators, built to those standards, have the proper design, capacity, drum speed and mixing action and the accuracy of water control required to produce a homogeneous concrete of uniform strength.

The Badge of Dependability: You have a right to insist on this Rating Plate on any truck mixer that serves your jobs. It is available to all who comply with the quality standards jointly established, for your protection, by the National Ready Mixed Concrete Association and the Truck Mixer Manufacturers Bureau.

These member manufacturers comply with Bureau standards:

BLAW-KNOX DIVISION Pittsburgh, Pa.	CONCRETE TRANSPORT MIXER CO. St. Louis, Mo.	THE T. L. SMITH COMPANY Milwaukee, Wis.
CHAIN BELT COMPANY Milwaukee, Wis.	THE JAEGER MACHINE COMPANY Columbus, Ohio	WORTHINGTON PUMP & MACHINERY CORP. Dunellen, N.J.

Prestressed Bridge

(Continued from page 164)

well under one ton. This is without the cable which, with the end connections, is Class A material; however, allocations for this material may be obtained in ample quantities by the individual concrete products plants.

In addition to bridge and stadium construction, prestressed block beams have been used in building construction with economical results. In Nashville, Bryan and Dozier designed a 45-ft. floor span with a warehouse loading of 100 lb. per sq. ft., using block beams. The beams are readily adaptable to heavy loads and fireproof construction for floor and roof slabs over 20-ft. span.

Any concrete products manufacturer looking for items to bolster his market might investigate this type of unit. Plants are setting up for beam assembly and also for sale of block to counties and contractors who plan to handle assembly at the job site. The original investment is low, and the interest by builders is great at this moment. Probably there will be other uses developed for the unit. Peyton's Concrete Products Co., needing a 10-ft. high fence to protect a cubing yard, constructed it by laying up the bridge block; the units created such an interesting pattern that sales have resulted for use in other decorative designs.

Wisconsin Producers

(Continued from page 168)

search, State College of Washington, Pullman, was Mr. Shore's third review. In Wegner's studies, he said, block were subjected to varying conditions of moisture over varying times and periods. Block made of pumice aggregate showed lower percentage total absorption than block made of sand and gravel. For equal variations of humidity, pumice block showed more dimensional variations than sand and gravel block; furthermore, pumice block also show greater dimensional changes at or less than 40 percent moisture content. A permanent net contraction takes place in all block during the first 45 days after leaving steam kilns, and here too pumice block contraction is the greater. Indications were that 16-in. block expanded 0.005 in. the first five days after manufacture, then returned to original size in 90-100 days.

A test made by J. A. Burke, Jr., of "Experiment, Inc.," was discussed by Mr. Shore. Here high pressure steam curing in an autoclave was found to produce a precast masonry unit having a smaller percentage drying shrinkage than the standard low pressure steam curing.

High pressure steam curing was also investigated by D. J. O'Connell, materials testing laboratory, school of engineering, Manhattan College, New

York, N. Y. As reported by Mr. Shore, test data show that the average shrinkage per 18-in. block varied little between high pressure and low pressure cured block, regardless of moisture condition. Below 15 percent moisture content, shrinkage of all block tested, regardless of curing method, proved identical. Mr. Shore suggested that the reason for the different results might be due to the age of the block tested, in this case more than 45 days old.

In presenting his summation of the papers, Mr. Shore said that steam curing is only one of the factors in block variation. Concrete block can vary in size due to initial shrinkage after manufacture, by shrinkage due to moisture variation, and contraction and expansion due to temperature changes. Many of these changes tend to become cumulative. He suggested that size variations due to temperature changes, an often overlooked cause, called for recommending the use of wire mesh to take up the tensile stresses set up, as well as the use of contraction joints.

Business Outlook

Dr. Francis Calkins, professor of finance, Marquette University, Milwaukee, pointed out some of the economic perils facing the nation, in his talk on business outlook for 1952. He questioned where the money will come from for a $20 billion increase in defense spending. It could be obtained by increasing taxes, but that would take nearly one-third of consumer income, unlikely in an election year. Raising prices to help increase taxes would seriously undermine O.P.S., he said, and increase inflationary pressure. Contradicting President Truman's Council of Economic Advisors further, Dr. Calkins doubted that the 2,000,000 new defense workers ostensibly needed can be found.

Attempts by the administration to regiment the country's economy are becoming serious, the speaker said. Much the same pattern as used initially by Russia and Germany is being followed, but the important thing to keep in mind is that complete economic regimentation would require political regimentation.

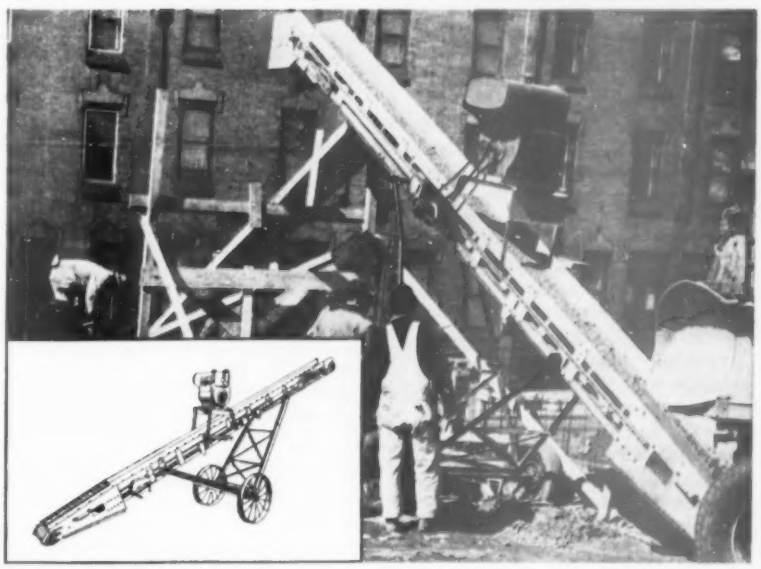
Dr. Calkins predicted that during 1952 wholesale prices will move up, possibly 10 percent, but consumer price level may only increase 5 percent; that the construction industry will be hard hit by cutbacks, falling below the 800,000 starts planned; that unemployment in the building trades may hold prices down; and that credit restrictions will tighten, at least for the first part of the year.

An open forum held at the close of the second meeting day brought four panel members together to lead discussion on curing, code requirements and design. The panel members were Mr. Thern; Mr. Shore; O. N. Olson, professor of engineering, Marquette University, and Robert Burmeister, engineer, City of Milwaukee Laboratories.

One in a series of factual reports from owners of Farquhar Conveyors

FARQUHAR CONVEYOR SAVES $125 A WEEK ON CONSTRUCTION JOB*

*at M & L Construction Company, Philadelphia, Pa.



THIS Farquhar Conveyor, used by the M & L Construction Co., unloads 6½ cubic yards of wet concrete in 10 minutes, direct to forms. On one job alone, it saved the labor of two or three men—saving $125 a week, and quickly defraying the Conveyor's initial low cost of $1200. In addition, costly runways, scaffolding, buggies and wheelbarrows were eliminated!

Whether you move coal, gravel, sand, aggregates, cartons, boxes, bundles, bales, or any kind of bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut *your* handling costs to rock bottom! One or more of the complete line of Farquhar portable, semi-permanent and permanent conveyors will solve your handling problem. Our engineers will be glad to consult with you . . . at no obligation!

Farquhar CONVEYORS SAVE YOU MONEY

WRITE for complete information to A. B. FARQUHAR CO., *Conveyor Div.*, Dept. F-28, 142 N. Duke St., York, Pa. or 618 W. Elm St., Chicago 10, Ill.

WORLD'S MOST COMPLETE CONVEYOR LINE

HYDRAULIC PRESSES • FARM EQUIPMENT • FOOD PROCESSING AND SPECIAL MACHINERY

COMMENT
from the BUTLER ENGINEER

February, 1952

Priorities...and we must read Japanese yet!

Ah me! These priorities. A fella called up long distance. Had to have a Butler Ready Mix Plant, not next month, not next week, but as of NOW.

"Look! he said, his voice shaking with intensity. "I've got a Directive — a DX Priority!"

Ah me, again! A DX Priority gets anything—absolutely anying—except steel, aluminum or copper. A DX is for some lad with 10,000 army trucks, all complete and ready for shipment except for door handles. It will get those handles *immediately*—if they're made of papier maché.

•

One of our distributors vacationing in a foreign land heard of a construction job nearby. Building a foundation for an enormous catalytic petroleum cracking plant. Cost: 7 million dollars per copy. So, he went out tc watch the work.

He found a crew of men dumping bags of cement into a rock crusher. What goes on? "The cement — she is got hard. We break it up to mix."

A 7 million dollar structure on foundations built with air-set cement!

Our distributor got hold of the big boss in time. But the grapevine carried the news of Trouble (with a capital T) to the foreman who took off like a rocket in a jeep and didn't show for two weeks.

•

We've had spec drawings with all notes in Greek, Turkish and Swiss but now comes a set in Japanese! Are we linguists or engineers?

Much more of that and we'll extend a cordial invitation to the United Nations to settle in Waukesha—except Mr. V——, that is.

See you soon.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

New Procedure for Equipment Allocation

CMP-REGULATION 5, as recently amended by N.P.A., applies to all affected operations beginning with the first calendar quarter of 1952. The regulation applies to the ready-mixed concrete industry, but not to the sand and gravel industry whose MRO procedures are governed by M-78 of D.M.A.

The regulation was amended to provide assistance to persons who require materials for installation purposes and to make other changes deemed necessary. It supersedes Amendment No. 1, issued August 10, 1951. The amended regulation provides a uniform procedure for obtaining limited quantities of controlled materials and products and materials other than controlled materials for MRO, minor capital additions and installations. It also provides separate quarterly quotas of $1000 for each of these three classifications.

The setting up of a procedure for obtaining assistance in installation operations is a new provision of the regulation. "Installation," as defined in the regulation, means the setting up or relocation of machinery, fixtures, or equipment in position for service and connection thereof to existing service facilities in an existing building, structure, or project, where the total cost of all materials does not exceed $1000 for any one complete installation. The controlled materials used for an installation, however, are limited to 2 tons of carbon steel, 200 lb. of copper products, and no aluminum, stainless steel or alloy steel.

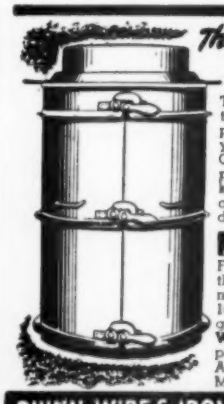
The allotment symbol MRO may be used on delivery orders for controlled materials for maintenance, repair and operating supplies, installation, and minor capital additions, but only for that amount of controlled material actually needed, and not exceeding the quantity limitations.

A producer who manufactures a Class A or B product, not for sale, but solely for his own use as MRO, material for installation, or minor capital addition, may use the MRO symbol for obtaining the controlled material required for such production. He may not, however, apply to an industry division or claimant agency on Form CMP-4A or on Form CMP-4B for an allotment of controlled material or for a DO rating for such production, nor may he use the self-authorization procedure provided in Direction 1 to CMP-Regulation No. 1. If, however, the materials required for such production are not controlled materials, the products or materials required may be obtained by use of the DO-MRO rating.

The allotment symbol MRO and the rating DO-MRO may not be applied by a person to obtain in any quarter (calendar or fiscal) installation materials for a total of installations exceeding 10 percent of the quarterly MRO quota, or $1000, whichever is greater. The same ruling applies to materials for minor capital additions.

One section of the regulation deals with requests for modification of quarterly quotas. Increased operations and higher prices, in some cases, have created undue hardship for producers. If a producer feels his quota limitation is too restrictive, he may apply for an increased quota. Once an increased quota is authorized, it becomes the standard quota unless the increase was granted on a temporary basis. A request for an adjustment of the MRO quota must be submitted in writing in triplicate on Form NPAF-78; a request for an adjustment of the installation or minor capital addition quotas or a request for an exception to any other provision of the regulation, must be submitted by letter in triplicate and must set forth all pertinent facts, the nature of the relief sought and the justification therefor. Applications for adjustment of quotas should be addressed to the Building Materials Division, National Production Authority, Room 327, Old GAO Building, Washington 25, D. C. The National Ready Mixed Concrete Association has offered to help association members with applications for increased quotas.

KEEP
ABREAST
WITH
INDUSTRY
TRENDS
THROUGH
ROCK
PRODUCTS



The "Quinn Standard" FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

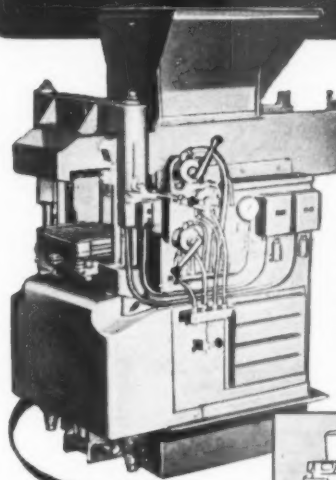
For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers QUINN CONCRETE PIPE MACHINES.

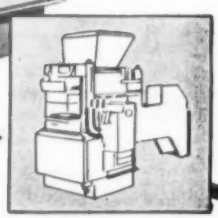
QUINN WIRE & IRON WORKS 1603 17TH ST. BOONE, IOWA

HIGHEST QUALITY BLOCKS...
LOW INITIAL INVESTMENT

Columbia
"BASIC" Block Machine

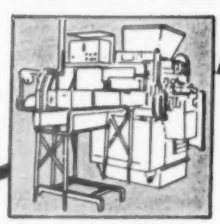


Rugged, versatile design, the Columbia Basic meets every need of the small producer and will grow with production requirements!



ADD PALLET FEEDER AND FEED DRAWER AGITATOR

. . . when demand requires higher production, just add pallet feeder and feed drawer agitator to speed up production, keep pace with sales!



ADD AUTOMATIC CONTROLS AND PALLET CLEANER

. . . and your Columbia Basic becomes a most modern, fully automatic, electronic controlled block maker! The Basic truly grows with production requirements!

THE COLUMBIA BASIC INCREASES IN VALUE AS BLOCK PRODUCTION GROWS!

As more production capacity is needed, you can add a pallet feeder, feed drawer agitator, automatic controls and pallet cleaner! Each addition speeds production . . . increases the machine's value as a block producer and profit maker for you! Use the same basic Columbia from manual operation to fully automatic! Keep abreast of your block production with a Columbia Basic and you'll keep abreast of the block making industry!

Columbia MACHINE WORKS
107 S. GRAND AVE. VANCOUVER, WASH.

truck-man runs
18,000 HOURS
without overhauling

Here's what Knox Concrete Products, Inc., Knoxville, wrote us when they placed an order for replacement parts recently:

". . . We are not only well pleased but we do not believe there is a piece of equipment on the market which would serve our requirements any better . . . Our normal load would probably run in the neighborhood of 4000 lbs. . . . We now have four Truck-Men . . . that run possibly *20 hours every day continuously* . . . The cost of operating a Truck-Man is certainly extremely low, as it uses very little gas and oil . . . We have had very little maintenance on this equipment."

". . . After six years at approximately 10 hours per day steady running I find it necessary to rebuild the majority of gears, sprockets and other movable parts on one Truck-Man and prepare to do so on another . . ." says Cement Block Industries, Coral Gables, Florida.

What more need we say? That last statement works out to approximately 18,000 hours of trouble-free operation. What would the record show if they had been using the *new* Truck-Man with its husky 5.8 h.p. Wisconsin engine? It's Truck-Man's low weight to payload ratio combined with rugged power that makes possible its unequalled efficiency in block-plant operation. You burn only a gallon of gas on most 8-hour shifts yet spot the heaviest racks in jig-time. Rubber cushioned ride, hydraulic lift, smooth start and stop mean no costly checking of blocks. Lower costs from purchase through maintenance and big savings in manpower—everyday—for years—make Truck-Man your *first* necessity for block handling. Available in skid, pallet, platform and *New* tractor models.

Send for full details in our new 1952 catalog.

truck-man Div. of The KNICKERBOCKER CO.
650 Liberty Street • Jackson, Mich.

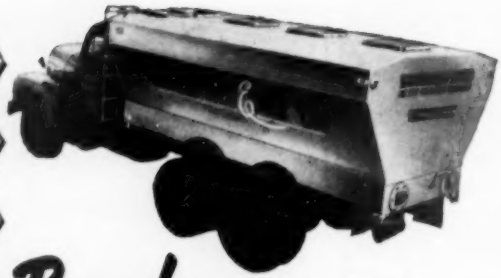
Name_____

Title_____

Address_____

City_____ Zone____ State_____

GUARANTEES DELIVERY
REDUCES INVENTORY
PREVENTS SHUTDOWNS
ELIMINATES BAG COSTS
BREAKS RAIL SITE LIMITATIONS



Baughman "Hi-Speed"
BULK CEMENT TRANSPORT BODIES

Break the bonds of rail shipment restrictions! Stop undependable deliveries . . . the limitation of plant location to rail sites . . . the cost of bags, bagging and unbagging. Eliminate the necessity for larger inventories to tide you over when rail shipments fail to arrive.

Save money, labor, time . . . handle cement IN BULK! Self-Unloading Baughman transport bodies are designed and built for high speed, low cost loading, hauling and delivery. Full range of sizes and capacities for truck, trailer and semi-trailer — there's one or more perfectly fitted to YOUR REQUIREMENTS.

● *Call, wire or write for details. No obligation. More than 25,000 Baughman Self-Unloading Bodies in use from Coast to Coast.*

BAUGHMAN

BAUGHMAN MANUFACTURING CO., Inc.
1121 Shipman Road, Jerseyville, Illinois
"There is a Baughman Distributor Near You"

Septic Tank Producers Meet

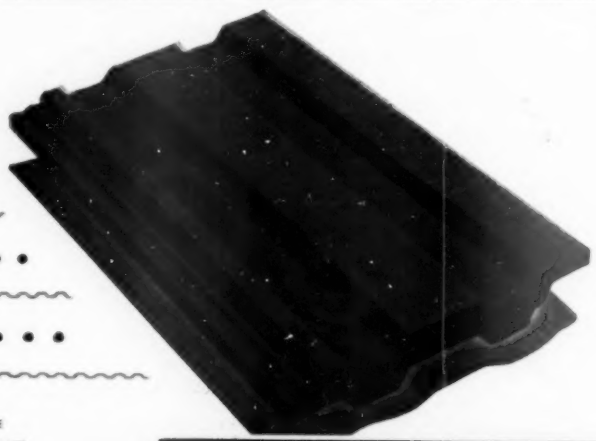
ILLINOIS PRECAST CONCRETE Septic Tank Manufacturers' Association recently held its fourth annual statewide meeting at Springfield, Ill. The two-day convention featured a banquet and a discussion of sanitation and installation problems.

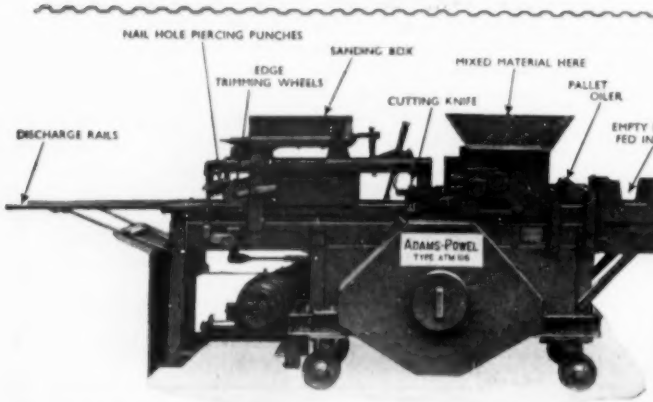
Among those appearing on the program were James B. Coulter, senior assistant engineer, U. S. Public Health Service, Cincinnati, Ohio, who discussed research studies on household sewage disposal systems; William E. Budd and Otto Halden, State Department of Public Health, Springfield, Ill.; and Eugene Mittelberg, field representative for the Illinois Retail Plumbers Association, Mt. Sterling, Ill., who discussed the 1951 Illinois plumbing licensing act.

LeRoy Klueter, Edwardsville, Ill., was elected president of the association for the 1952 term, succeeding J. E. Sheley, Moline, Ill. Other officers elected were Bernard Abel, Pekin, Ill., vice-president; and Robert Humphrey, Aurora, Ill., secretary-treasurer. John H. Campbell, Kankakee, Ill., and Francis Ryan, Seneca, Ill., were named directors.

REDI-MIX CONCRETE CO., St. Charles, Mo., established by H. C. Goellner a year ago, is building a ready-mixed concrete plant at Wentzville, Mo.

ROOF TILES OF
HIGHEST QUALITY . . . .
BEAUTIFUL COLOURS . . .
PRACTICAL COST . . . .





.. WITH THE
Adams-Powel
Roof Tile Making Plant

Many users of the Adams-Powel Concrete Roof Tile Making Plant have redeemed the entire cost of the installation within 12 months operation. Up to 2,000 tiles can be produced per hour. Many customers have ordered as many as eight complete plants. Write for further details to Manufacturers.

● ANGLO-SCOTTISH TOOL CO. LTD. GATESHEAD II, ENGLAND ●

DUR-O-WAL

TRUSSED *Design*

now available in Greater Supply!

Improved delivery schedules are now being maintained in the shipment of patented Dur-O-wal . . . the trussed design reinforcing member which gives masonry walls a backbone of steel.

Masonry walls reinforced with patented Dur-O-wal are built for lasting performance. Trussed design means permanent beauty, scientifically designed protection from cracks. Lays fast, economical, ideal for all masonry construction.

Cedar Rapids Block Company
Dur-O-wal Div., 656 12 Ave. S.W.
Cedar Rapids, Iowa

Dur-O-wal Products, Inc.
P.O. Box 628
Syracuse 1, N.Y.

A PROFITABLE SIDELINE FOR YOU

ASK YOUR PLUMBER

He will tell you steel septic tanks are in drastic short supply, almost impossible to get because of the tight steel market.

With $5.00 worth of cement and sand, and with our STEEL TANK FORMS, you can make, in your spare time concrete septic tanks that people really want and for which they will pay from $60.00 to $75.00.

Sometimes a sideline can become your main business. Operators who are using our Steel Tank Forms are finding this to be true now for they are enjoying a big demand for their concrete septic tanks.

Low in cost, $330.00 per unit. Terms, $110.-00 cash or money order, balance C.O.D.

We can also supply handling sling together with necessary fittings to install a boom on any dump truck to handle Septic Tanks.

Price $25.00.

ALBERT CAHILL STEEL & IRON WORKS
Gem Ave. **Toms River, N. J.**

GET THESE ADVANTAGES BY ADDING

SOLVAY

CALCIUM CHLORIDE TO YOUR CONCRETE

- **Cuts setting time in half.**
- **Reduces curing period; permits quicker use.**
- **Increases both early and ultimate strength.**
- **Offsets effects of low temperatures.**
- **Can be used with regular, air entrained, high early, colored or low heat cement.**

SOLVAY Calcium Chloride

- ADDS EXTRA STRENGTH
- SPEEDS OPERATIONS
- CUTS DELAYS

FREE BOOK GIVES FULL DETAILS. "The Effects of Calcium Chloride on Portland Cement" is offered by Solvay to architects, engineers, contractors — anyone who works with concrete. It is filled with authentic information and answers all your questions about the use of Calcium Chloride in concrete. For your free copy, write on your business letterhead.

SOLVAY SALES DIVISION

Allied Chemical & Dye Corporation

Dept. CP-2, 40 RECTOR STREET, NEW YORK 6, N. Y.

WHAT VOLUME OF GROUND CINDERS DO YOU NEED?

At Ceredo, West Virginia, The Union Concrete Pipe Company installed this AMERICAN No. 9 Grinder to work on acres of cinders. Results? 30 yards of minus 3/8" aggregate . . . every hour, every day.

Select from 8 AMERICAN Grinders Hourly Output 4 Yards to 75 Yards!

Write your own ticket for your plant's cinder-grinding requirements . . . one of the 8 AMERICAN Grinders will give you the output needed . . . deliver minus 3/8" mesh aggregate without additional separation! Your AMERICAN Grinder will require minimum maintenance . . . will conserve power . . . will help produce low-cost, top-quality cinder block. Write . . . wire . . . phone . . . ask for an AMERICAN grinding expert to help you lick your problem.

CAPACITIES . . . YDS. PER HOUR

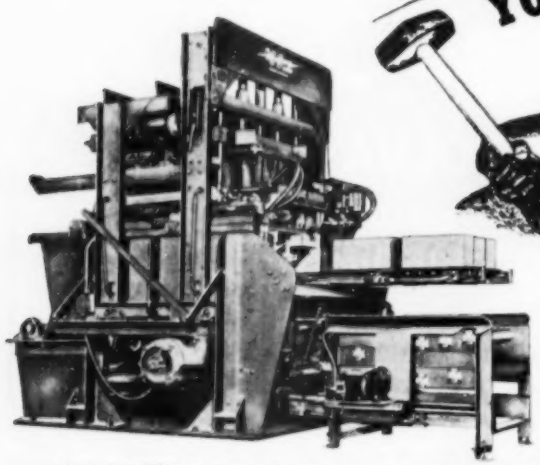
No. 5	4	No. 9	30
No. 6	6	No. 482	35
No. 7	12	No. 418	50
No. 8	20	No. 384	75

American GRINDERS by

W. A. RIDDELL CORP.

BUCYRUS, OHIO

YOU PACK YOUR BLOCKS With a GOCORP!



You don't drive a nail with a rubber hammer . . . nor can you get the best block compaction when pallet support depends on rubber or springs. GOCORP clamps the pallet to the mold . . . Vibrates the combination (pallet and mold) with sharp, swift sledge hammer blows . . . No cushioned deceleration common to other machines. Whiplike direction change at each end of the stroke means faster pickup during the stroke and a harder packing blow.

With GOCORP plain pallet machines . . . the King—6 at a time . . . the Senior (illustrated)—3 at a time . . . the Prince—2 at a time . . . You also get:

- **100% Hydraulic Operation**—adjust any operation without affecting others.
- **Main Hopper Feed** — no old fashioned feed drawer.
- **One Man Operation**—reduces labor cost.
- **Front Pallet Feed**—saves space, reverses pallet each time used.
- **The BEST in service.**
- **Other GoCorp Equipment**—Junior Cored Pallet Block Machines . . . Batch Mixers . . . Pipe and Tile Machines.

THE GENE OLSEN CORP.

407 Grace St. Adrian, Mich. Phone 2120

To convert from dry batch to Central Mix, for a package central mix plant, or a semi-portable plant, write: SuPREMIX, Incorporated (an affiliate of GoCorp), 401 Grace Street, Adrian Michigan.

Concrete Pipe Machinery Co.

MODEL "T" BELL-UP "McCRACKEN" MACHINE

With 40 cu. ft. mixer and skip-loader to serve machine

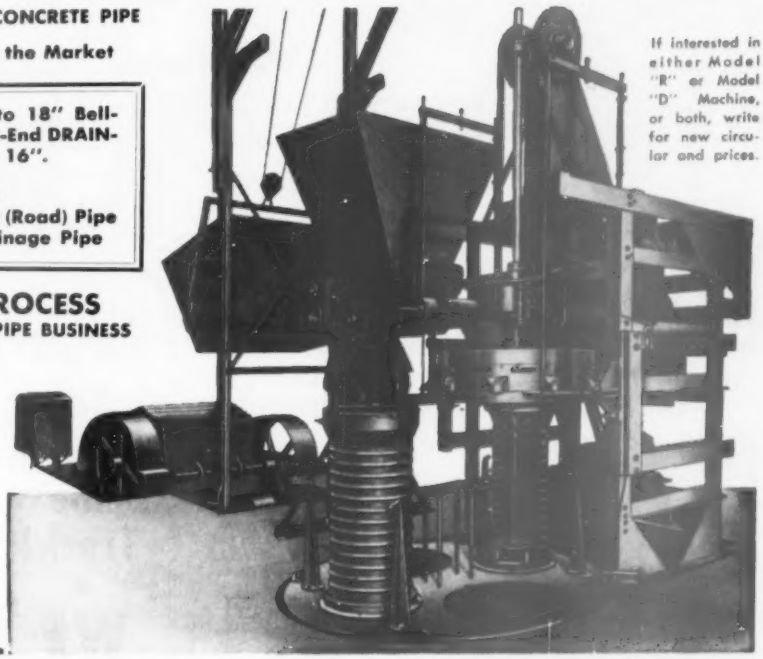
FOR MAKING PLAIN AND REINFORCED CONCRETE PIPE

Range of Sizes — 4" to 36" — 80% of the Market

ALSO MAKE MODEL "R" — Sizes 4" to 18" Bell-Down Machine. MODEL "D" Makes Butt-End DRAIN-TILE in 1 or 2 ft. lengths. Sizes 4" to 16".

USES FOR CONCRETE PIPE

Storm & Sanitary Sewers • Culvert (Road) Pipe
Irrigation (T&G) Pipe • Farm Drainage Pipe



If interested in either Model "R" or Model "D" Machine, or both, write for new circular and prices.

PACKER-ROLLER-HEAD PROCESS
LEADS THE WAY TO MORE PROFITABLE PIPE BUSINESS

Eight-Hour Shifts Produce:

SEWER
Plain B & S Pipe
2400 feet — sizes 4" to 10"
1750 feet — sizes 12" to 18"
1200 feet — sizes 21" to 24"
CULVERT "ROAD"
Reinforced T & G Pipe
1600 feet — sizes 12" to 18"
1100 feet — sizes 21" to 24"
900 feet — sizes 30" to 36"

Concrete Pipe Machinery Co.
Cable Address: Macpipe

EXPORT OFFICE
P.O. Box 252
Pleasantville, N. Y.

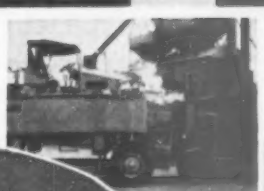
MAIN OFFICE
Sioux City (17)
Iowa, U.S.A.

Here's how a GERLINGER CARRIER "ADDS UP" for this Manufacturer:

Lower Handling Costs + Less Block Breakage + More Trips Per Day = GREATER PROFITS

L. M. Kennedy & Sons deliver concrete blocks with their Gerlinger Carrier anywhere within a 25-mile radius of their Philadelphia plant. The Gerlinger each trip delivers 6-ton loads of 400 blocks directly to the customer's job, spotting the load within arm's reach of the block layers. A special power attachment enables the carrier operator to gently unload the blocks, with the cube load remaining intact. The firm reports that the use of the Gerlinger Carrier has tripled the number of deliveries it can make—over its former conventional delivery method. Block breakage in transit has almost entirely been eliminated.

Gerlinger Carriers are built to handle such heavy loads—with easy maneuverability in city traffic and surplus power for traction over rough terrain. Full-visioned operator's seat gives full view of load and road. These—and other job-proven features—make Gerlinger Carriers all-purpose, cost-cutting material handlers. For specific data to fit your operation drop us a card today.



Four hundred 30-lb. concrete blocks are loaded on the Gerlinger by lift truck in this unique application in the yard of L. M. Kennedy & Sons.

Lower: Minutes later this giant load is delivered intact to customer's job within easy reach of workmen.

GERLINGER CARRIER CO.

G-250

GERLINGER CARRIER CO., DALLAS, OREGON

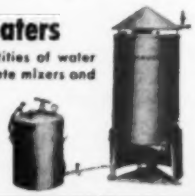
HAUCK
Heaters & Thawers
Eliminate Winter Freeze-Ups and Delays

Combination Concrete Heater and Thawer
Introduces clean heat right into concrete mixer drum. Burner clamps on mixer; can also be used as thawing burner.

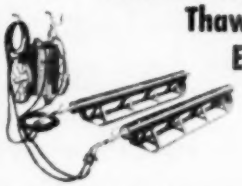
Thawing Burners

For hopper cars, concrete forms, stone, sand and gravel piles. Heavy duty burners with welded steel fuel tanks—deliver large, intense flame; save time and labor.

Water Heaters
Heat large quantities of water quickly for concrete mixers and central mixing plants.



Portable Hopper Car Thawing Tube Equipment



Thaws sand, gravel, cinders quickly for dumping. Powerful, smokeless heating flame. Fuel oil-burning compressed air type and kerosene-burning hand pump type.

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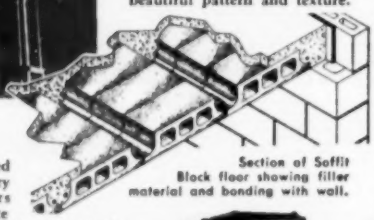
HAUCK MANUFACTURING CO.
137-147 Tenth St., Brooklyn 15, N. Y.

SELL MORE BLOCK ON EVERY JOB!

Furnish VIBRAPAC SOFFIT BLOCK for ALL FLOORS and ROOFS

Permanent, Fireproof Floors and Roofs. Low initial cost and maintenance. Natural base for radiant heat installations. Provide surface of maximum acoustical and insulation value. Can be plastered, or if left exposed, makes a ceiling of beautiful pattern and texture.

Removing Centers from Finished Floor.

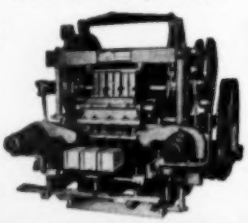


Section of Soffit Block floor showing filler material and bonding with wall.

Soffit Block are supported in place with temporary adjustable steel centers while reinforced concrete slab is placed and cured. This eliminates timber shoring and leaves space below clear during construction.

BESSER VIBRAPAC PRODUCES SOFFIT FLOOR AND ROOF UNITS

The same machine that produces high quality concrete masonry units in all styles and sizes, using Plain Pallets. Continuous, full capacity operation. Fully automatic. No machine operator required.



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ALPENA, MICHIGAN, U. S. A.
Complete Equipment for Concrete Products Plants

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You Furnish the Truck!

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WE CAN SUPPLY
HI-LO or HI-LO Jr.
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Drive your Truck to our Plant . . . We will install Mixer, ready for return trip . . . Visit . . . Save on Shipping . . . Avoid Delay.

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4987 FYLER AVE. • ST. LOUIS 9, MO.
Serving the CONCRETE INDUSTRY 20 YEARS

T.C. WOVEN WIRE SCREENS

ACCURATE • DURABLE • ECONOMICAL

The reliability of T.C. Alloy Screens has carried them into all parts of the world. Made in Standard and Special Weaves, with Square or Oblong Openings — from 10 mesh, .035" wire on up. Write today for Catalog No. 42.

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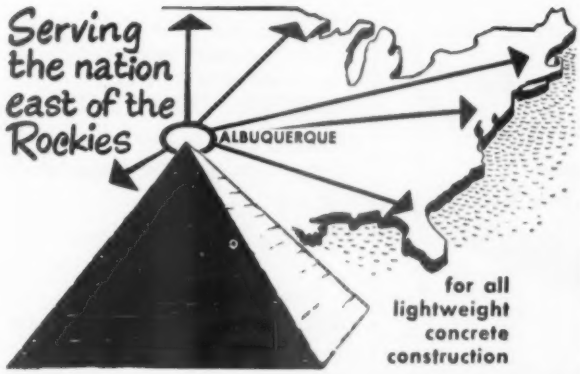

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SKYSCRAPERS — WAREHOUSES
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RESIDENTIAL AND COMMERCIAL BUILDINGS

CHECK THESE ADVANTAGES

ECONOMY • PERMANENCE • FIRE RESISTANCE • BEAUTY
INSULATION • SOUNDPROOFING

For details on this lightest of lightweight aggregates for structural concrete, write

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Offered in carload lots to contractors, block plants, and ready-mix plants.

now available!

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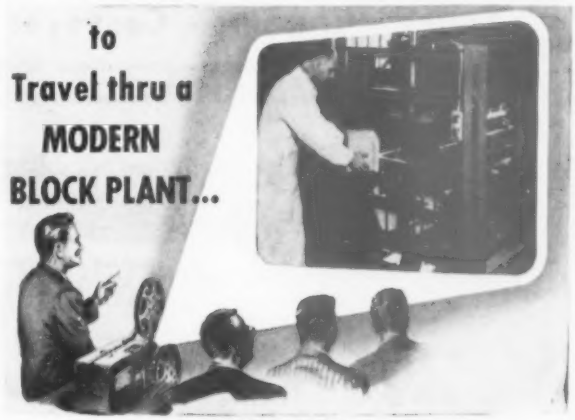
BESLITE, the superior lightweight aggregate that makes Marietta concrete tanks first choice for safe, durable, permanent storage of all raw bulk materials, can improve all your structural and precast concrete products. BESLITE-made concrete is light, strong, uniform, smooth-textured, fireproof, acid resistant and has excellent acoustical and insulating properties. Marietta, now, makes BESLITE available to all concrete products manufacturers and ready-mix concrete producers . . . in two sizes—½" to No. 4 and minus No. 4—by truck or rail shipments.

For the best industrial storage systems, insist on MARIETTA. For better concrete products, use BESLITE, by MARIETTA.

Write for full details.

THE MARIETTA CONCRETE CORP.
MARIETTA, OHIO • BALTIMORE MD. • CHARLOTTE, N. C.

YOU ARE INVITED



. . . as YOU RELAX in our Suite at the Hotel New Yorker
during the
32nd Annual Convention, National Concrete Masonry Association — Feb. 18-20

Please accept our heartiest invitation to join us in New York.

Relax with us, refresh yourself and see how the other fellow makes blocks. How he meets the difficulties everyone encounters and what new equipment he has found to be profitable.

Enjoy a period of good fellowship, meet many of your new and old friends, and see in operation THE KENT STANDARD BLOCKMAKER, the KENT LINTELATOR, KENT STEDIFLO MIXERS and the unique KENT BLOCKMATIC.

We'll be looking for you in February at New York.

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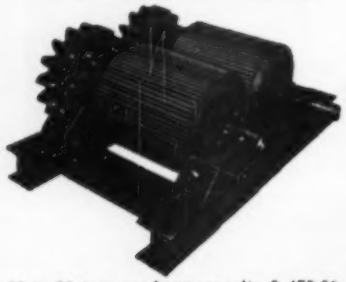

10 to 20 tons per hour capacity $ 479.00
25 to 50 tons per hour capacity 1144.00
Complete with hopper.

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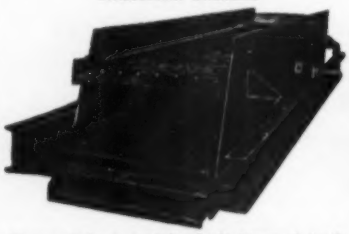
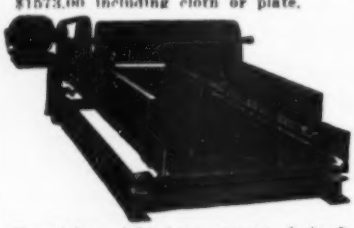


Heavy duty eccentric shaft types, 1 to 5 decks; screen sizes to 5x14. 4 double-roll, self aligning sealed bearings. Priced from $1573.00 including cloth or plate.



Eccentric weight type screens, 1 to 3 decks; sizes to 3'x8'. Including cloth or plates, from $479.00.

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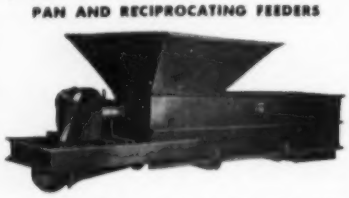

Complete with motor and drive. 15 to 225 tons per hour capacity.
Priced from $423.00

TRUCK SCALES

15 Ton Truck Scales $545.00
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Others to 50 ton capacity. All scales complete with structural steel weighbridge. Parts and weighing beams for most makes of motor truck scales.

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Troughing idler conveyors. Any length, belt widths to 60".
Prices from $450.00

Flat belt type bulk material conveyors. Any length, belt widths to 48"

SAVE! BUILD YOUR OWN CONVEYORS
We have standard sections, head and tail pulleys, take-ups, drives, idlers, speed reducers, sheaves, belting, etc.

TROUGHING IDLERS AND ROLLERS

All steel. Interchangeable with other well-known makes. Replaceable precision ball bearings. No bearing adjustments required. Easy to start and will run in cold weather. Rust-proof ball races; maintenance is negligible. All sizes in stock from 14" to 48" belt widths.

PORTABLE FLIGHT CONVEYORS

Mounted on rubber tires and adjustable undercarriage. All welded structural and sheet steel; double guided heavy duty chain; steel flights to 6"x24". Electric or gasoline power. Priced from $450.00.

PORTABLE BELT CONVEYORS

Troughing type for aggregate, cinders, sand, wet concrete. Flat-belt type for truck loading, piling of bags, block, brick, concrete units, lumber. Electric or gasoline powered, from $450.00.

WE HAVE MACHINERY FOR LIGHT-WEIGHT AGGREGATE, EXPANDED CLAY, AND PLANTS PROCESSING VOLCANIC AND OTHER NATURAL CINDERS.

More than 3500 mines and quarries have modernized with Bonded equipment.

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Pressed Steel Cored Pallets. Excess Equipment.

6000— 4"
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2500—12"

Also Corner and Sash Pallets in some of above sizes.

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Limestone Rock Quarry, 400 acres land, adjacent to Birmingham, at Trussville, several hundred thousand tons already primarily crushed, unlimited amount in Quarry, Silicon 2%. Seven houses, abundance of water. Sell on royalty basis or $150,000 outright. For details call or write J. E. Huffman, W. B. Leedy & Co., Inc. 2209 3rd Avenue North, Birmingham, Alabama.

STOP *that* WATER

With FORMULA NO. 640

A clear liquid—7 different resins in a solvent which penetrates 1" or more into concrete, concrete blocks, stucco; seals, holds 1250 psf water pressure. Applies quickly — no mixing — no furring — no membranes — no cleanup. Use on forms — wood or concrete.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

One Stearns Power Striper with all attachments for making a complete line of 8" blocks, reg. corners, sash & halves.
Approximately 1600 pallets
1300 reg.
200 corners
100 corner & sash comb.
45% Air Space Code Dacolt.
Also a lot of space parts for the Mach., All for $600.00.
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6" and 8" Sewer Pipe Molds for McCracken Pipe Machine.
5—6" B & S Sewer Pipe Molds making sewer pipe 3' long, ⅝" wall.
538—Pallet Rings.
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This equipment is in A-1 condition, immediate shipment.
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PRESSED STEEL PALLETS
In Stock
Send tracing or pallet for quotation.
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Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.

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90% of this fleet 1949-1950 and 1951 models LF and LJ 10 wheel Mack Trucks. Mixers are Jaeger and Rex 4½ and 5½ high discharge and horizontals, most of which are 49's, 50's and 51's. Some of this equipment can be purchased on rental-purchase plan. Most of it now available for immediate delivery.

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A Multiplex Complete Cement Block Machine, drying racks Pallets 8" & 4", 1 Ford dump truck 1½ T 1947. All in good condition. Can be seen in operation. Reason for selling is labor problem. Phone 334 Tiro.

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FOR SALE **COMPLETE MODERN VERMICULITE PLANT**

In Mid-Southern Town—Good Labor—Two Acre Plant Site—R.R. Siding 5 Cars—Bulldozer—2-34 Ft. Tracs. & Trailers—Ore Leases—Modern Propane Furnaces.

Capacity—1000 Bags Daily

OWNER RETIRING
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ARTHUR I. RANK
Philadelphia 46, Pa.

FOR SALE: One Stearns No. 7 Joltcrete Block Machine with 4", 8" mold boxes. 4,900 8" pallets including pilaster, bullnose, corner and sash, 4,400 4" pallets, also enough steel racks for these pallets. Salina Concrete Products, Inc., Box 146, Salina, Kansas, Phone 5437.

FOR SALE

Complete ready mix concrete plant set up and operating in Bull Shoals, Ark. Can be operated as is where is or moved to suit buyer. Very reasonable.

Connie Schadt
Box 46 **Bull Shoals, Ark.**

BETTER **PUMICE** FOR LESS MONEY

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Block plant in Yakima, Wash., completely equipped for 2200 steam cured block per shift; Columbia plain pallet machine; appraised value of land on main highway $20,000.00; buildings and equipment cost over $37,000.00; two large irrigation projects near just going under water; due to ill health of former owner this four year old plant with practically a new Columbia machine can be purchased for total price of $31,000.00. Terms: 25% down, balance $350.00 per month, 4% interest.

T. C. Brown
Pumice Products Co.
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FOR SALE
STEARNS No. 9 JOLTCRETE

with power carriage, height control, pneumatic off-bearer, 4"—8"—and 12" mold boxes with all attachments.

Also chimney and type A and B pilaster mold boxes.

7,000—4" Com. pressed steel pallets.
5,500—8" Com. pressed steel pallets.
1,500—12" Com. pressed steel pallets.

1—Stearns 28 cu. Ft. Mixer with 20 H.P. motor.

1—Stearns 28 cu. Ft. Vertical Skip Hoist

All of the above equipment is in first class operating condition and includes motors and starters and extra parts.

All above listed equipment priced at $12,000.00 F.O.B. Ephrata, Washington.

Pyramid Concrete Products Co.
Box 625, Ephrata, Wash.
H. A. Conklin, Phone 553

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GUARANTEED MOTORS
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Units of Every Size and Description

SQUIRREL CAGE MOTORS
3 Phase, 60 Cycle, 220 or 440 Volts
(*2200 Volts or higher)

H.P.	Make	Type	Speed
1000	*G.E. (New)	K63478	1800
750	*G.E.	KT	720
550	*G.E.	KF-559	3600
500	*G.E.	PBG	1800
500	*Fr-Morse	HS	1200
450	*G.E.	KF-5678	1200
400	*Cont. (New)	NZ	1800
400	*G.E.	IK	514
350	*Cr.-Wh	8C	3600

2—DIESEL-GENERATORS
NEW—31.25 KVA Rogers AC Generators, 3/60/120/208, d/c Exciter Driven by direct-connected Cummins Diesel Engine, Model H-1 Complete Control Panel —NEW.

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PHONE CANAL 6-2900
CHICAGO *Electric Co.*
1315 W. CERMAK ROAD
CHICAGO 8, ILL.

FOR SALE

ONE KELLEY AIR STRIPPER BLOCK MACHINE AND PARTS INCLUDING CHIMNEY PALLETS —ONE BLYSTONE 18 FOOT MIXER AND SKIP HOIST ALL COMPLETE WITH MOTORS, ETC. CAN BE SEEN IN USE. IMMEDIATE DELIVERY. ALSO 3300 FLAT PALLETS 18x18x¼ F.O.B. LITTLE FERRY.

HOFFMANN BLOCK CO.
LITTLE FERRY, N.J.

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1—Stearns Clipper Stripper Block Machine.
1—Material Hopper.
1—8" Modular Mold with Mortar Grooves.
1—4" Mold.
1200—8" Steel Pallets DISARM.
1200—4" Steel Pallets.
600—8" Cast Iron Pallets.
Extra Mold Liners — Misc. Spare Parts. All in First Class Condition. Price: $1400 F.O.B. Mexico, Missouri. Contact us for inspection at our Plant.

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BUY U.S. SECURITY BONDS NOW!

FOR SALE

1 Dunbrik machine, in good condition.
1 16 cu. foot mixer recently overhauled.
31 racks (each rack holds 720 brick). 20 of these racks are in fair condition. 11 are in poor condition but we have some repair parts to fix them up.
7500 steel pallets in excellent condition.
Approx. $300 worth of repair parts.
Elevator shaft and bucket batcher.
All motors necessary to run this equipment.
We would like to sell the above equipment as a unit. Above equipment is 4 years old. Priced for quick sale.
On this machine you can make the following units: 2¼x4x8; 2¼x8x8; 2¼x12x8.

TIFTON BRICK & BLOCK CO.
Tifton, Georgia

FOR SALE

F. C. George, completely rebuilt, two unit, vibrator with press-pak and air off-bearer with 4", 8" and 12" attachments and 4800 aluminum pallets.
1—28 cu. ft. Stearns mixer.
1—28 cu. ft. Skip Hoist.
1—spare mold box.
50—40 block (new) steel racks. Also spare parts. Perfect operating condition. Reason for selling, installing larger machine. Inspection can be made at

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Portable Concrete Plant—Erie Strayer concrete mixing plant, capacity 40 yds. per hr., for sale. Has had 6 months light use, and has always been under roof. Machine has receiving hopper, bucket elevator, and 3-compartment aggregate bin of 20-yd. capacity. Weigh-batcherg for aggregates and water. Automatic screw feeder pre-mixes cement with aggregates. Complete hydraulic controls. Now equipped with 30 h.p. motor, but can be readily converted for gasoline power. This plant is on display in Chicago.

Write Box K-34, ROCK PRODUCTS, 309 West Jackson Blvd., Chicago 6, Ill.

FOR SALE

Crushed and sized cinder aggregate, tested and approved for the manufacture of cinder blocks. Write:

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Box 116 Duluth 7, Minn.

FOR SALE

Universal Automatic Block Machine.
1700 8" Pressed Steel Pallets.
1600 4" Pressed Steel Pallets.
56' Dunn Mixer & Hoist, complete.
Portable Space Heater, 40,000 BTU.
Enclosed 15' Belt-Bucket Elevator.

MITCHELL CONCRETE PRODUCTS
Mahomet, Illinois

CONCRETE BRICK COLORS
CEMENT COLORS
MORTAR COLORS
made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

FOR SALE

1 Besser Super Tamper K-3 Automatic Pallet Feeder—Molds 4—6—8—10 and 12 with 2500 Pallets. Available in 30 days. $3000.00.

Braddock Building Material Co.
Woodlawn & 13th St.
Braddock, Pa.

FOR SALE

40 Bucket elevators all sizes and lengths, immediate delivery. 2 Ready mix truck mixers. 3 Compartment Butler Bin with scales.

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UNBREAKABLE PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

1 Stearns No. 7 Jolterete with the following:
12" moldbox and 1650 pallets.
8" moldbox and 3000 pallets.
4" moldbox and 2450 pallets.
This machine available now.

CONCRETE PRODUCTS CO.
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FOR SALE

BLOCK PLANT—Capacity 1500 blocks daily. In city of 15,000—no other within 40 miles. Photos and complete information furnished on request. Price $30,000.00. Might consider $10,000 cash for partial interest, with privilege of acquiring business later on.

CAMERON, JOYCE & SCHNEIDER, INC.
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Heavy Reinforcing Mesh for Sale—16" x 200' rolls, 60" x 92" sheets, No. 3 and No. 9 gage wires. Write Box K-33, ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois.

FOR SALE

1 Air operated offbearer.
35-66 block steel racks.
1 Large type stoker & retort.

498	12"x8"x16"	Modular	40% core steel pallets.
2700	8"x8"x16"	Modular	40% core steel pallets.
4400	4"x8"x16"	Regular	40% core steel pallets.
600	6"x8"x16"	Regular	40% core steel pallets.

1 Pallet oiler.

BRISTOL CONCRETE PRODUCTS CORP.
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FOR SALE

6—2 cu. yd. Concrete Transport Mixers.

Triangle Construction Co.
Carbondale, Illinois

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P. O. Box 52 Ashland, Penna.
Phone: 367

FOR SALE

I have two Ready mix Plants at Manchester and Monticello, Iowa. I cannot get a good manager for one of them. I will sell either plant. These are three truck plants. One has Block Machinery and the other has living quarters, six rooms over plant, also six acres sand and gravel with sand washer, drag and pump. A real bargain for some one. Write for full description. Phone 94 or 539. Henderson Ready Mix, Monticello, Iowa.

PACKER-HEAD WINGS
Both McCracken Type and Martin Travelers—PROVED to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

ALSO SEE CLASSIFIED ADVERTISING ON OTHER EQUIPMENT IN ROCK PRODUCTS' GENERAL SECTION

USE THE

CLASSIFIED

COLUMNS OF

CONCRETE

PRODUCTS

THE MOST

ECONOMICAL

WAY TO SELL

YOUR USED

EQUIPMENT.

WANTED

Wanted—Good used Stearns No. 7 Joltcrete or Clipper with pallets, racks, motor, mixer, skip, crusher. Will buy complete plant or separate items. State best cash price.

Leon Ramella
658 Stewart St. Welch, W. Va.

LAURENCE G. FARRANT
Consulting Engineer
908 Langford Building
Miami, Florida
Precast concrete frameworks and parking facilities.

Modern Streamlined—1000 Block Plant—85% Power Operated Including Loader. Highway Location—Fast Growing Town of 10,000. Excellent Wholesale and Retail Business at Profitable Prices. Doctor Says Sell. Investigate Thoroughly—Then Buy.

City Block & Supply Co.
Chillicothe, Mo.

FOR SALE
3 Block Lith-I-Bar, 20 months old for 16" or 18" block. Also following 16" attachments. 4"-6"-12" Brick, Chimney Block, ½ header, etc. 20 H.P. Compressor.
All in good condition and operating 16 hrs. per day Monday through Friday.
EDWARD CAMPBELL COMPANY
S.E. Cor. East Ave. & Walnut Rd.
Vineland, N. J.

USED CRUSHER FOR SALE

Will Crush Cinder—Slag—Stone—Gravel, etc.
1—4 AHV Unit—Includes Holland No. 26 Hammer Crusher, Mounted over 4A—16x16 Rolls with 16x48 Vibrating Screen, Mounted Between Units.
IDEAL BLDRS. SUPPLY AND FUEL
4720 Brooke Park Rd.
Cleveland 9, Ohio

FOR SALE

900 8" pallets.	1400 6" pallets.
900 10" pallets.	1400 4" pallets.
900 12" pallets.	Also cores.

Ideal Cement Products
4201 N. 124 Street
Milwaukee 16, Wis.
Phone—Sunset 1-9370
Armin Pulvermacher—Mgr.

FOR SALE
Going Concrete Block and Supply Business with established sources Supply and Outlets. Complete plant and stocks a snug year round one-man operation. Box 462, Beaufort, S. C. Terms to reliable buyer. Owner must sell due to other business interests.
JIMPAT COMPANY
Box 462 Beaufort, S. C.

POSITION WANTED

ENGINEER PRESENTLY EMPLOYED SEEKS NEW CONNECTION AS PLANT ENGINEER OR SUPERINTENDENT FOR CEMENT PLANT. EXPERIENCE AND THOROUGH KNOWLEDGE OF ROTARY KILNS AND GRINDING MILLS OF DIFFERENT MANUFACTURERS. I CAN BUILD AND OPERATE CEMENT DOLOMITE AND LIME PLANTS. ENGINEERING EDUCATION AND 25 YEARS OF EXPERIENCE IN THE HEAVY INDUSTRIAL FIELD. OPPORTUNITY SHOULD OFFER SUBSTANTIAL EARNINGS. LOCATION PREFERABLE EAST. REFERENCES ON REQUEST. BOX K-41, CONCRETE PRODUCTS, 309 W. JACKSON BLVD., CHICAGO 6, ILLINOIS.

FOR SALE

One Stearns No. 9 Joltcrete Block Machine Complete with 4" 8" 12" Mold Boxes and Power off bearing Hoist.

6000 4" Pallets.	3500 12" Pallets.
4500 8" Pallets.	1500 8" Corner Pallets.

Plant now in operation. Priced to Sell.
Keltez Concrete Block Co., 190 Northfield Rd.
Phone Be 2-3630 Bedford, Ohio

FOR SALE

Dunbrik Machine in excellent condition, with 3880 Pallets, Jumbo brick attachment, 15 Brick Carts, one three-wheeled Jack truck, one Pallet Dunker. Value New over $10,000.00; our price $4490.00.
I. W. MILLER & SON, INC.
336 Coleman Street, Olean, New York

FOR SALE

Anchor Stripper and Tamper. Blystone mixer, 1300 pallets, etc. A bargain. Installed larger machine.

Minglewood Coal & Ice Co.
Phone 32 Wooster, Ohio

FOR SALE

Over 5000 Steel Pallets—Standards—Corners — Jambs. Code — Dram. 5000 Steel Pallets and Mold Box—Code Totem. All in good condition. Reply—Box K-40, CONCRETE PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois.

FOR SALE—Steel Pallets

2000—18x20x3/16, used pallets in good shape—Reasonable.

Pumi-Block Company
2320 South Main St.
Santa Ana, California

FOR SALE TRUCK MIXERS

2—3 yd. Ransome Hi-up Mixers mounted on 1947—C50 Autocars—$4500.00 ea.
1—2 yd. Rex Horiz. Mtd on 1947—522 G.M.C.—$2750.00 2 sp. rear. All in perfect working condition.
YARDVILLE CONCRETE SUPPLY CO.
Yardville, N. J. Phone Trenton 5-1408

TRUCK MIXERS FOR SALE

2 Jaeger 1950 3 yards on 1950 GMC tandem axle trucks with auxiliary transmissions.

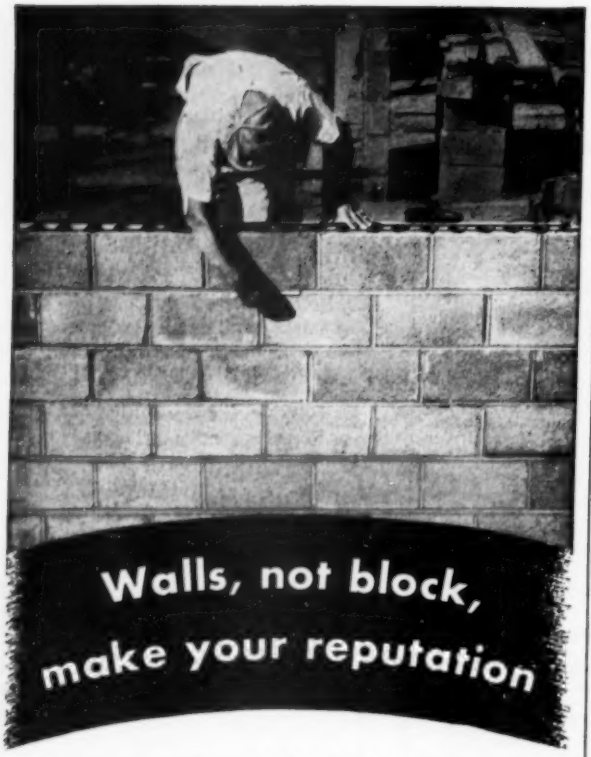
AMERICAN CONCRETE SERVICE CORP.
Hamilton, Ohio

NEW CEILING PRICE REGULATION FOR USED MACHINERY

New ceiling price regulations covering the sale and purchase of used machinery, CPS-105, promulgated by O.P.S., went into effect December 17, 1951. These new regulations set the method of determining maximum ceiling prices for the sale of used machinery. They cover many types, among them rock crushers and plants, stone working machinery, electric motors, mining and quarrying machinery (including mine cars and trucks), loading and unloading equipment designed specifically for industrial use, asphalt plants, etc.

In brief used machinery under the new regulations is classed (1) rebuilt and guaranteed; (2) those units not qualifying in that class. The ceiling price of class (1) units is 85% of its base price, which is the manufacturer's current F.O.B. shipping point price for the same unit, and for units class (2) it is 55%. An alternative method of calculating the ceiling price is the depreciation method for certain types of equipment as outlined in the regulations, with depreciation varying from 3% to 30%. When the depreciation method is used on units not rebuilt and guaranteed, the ceiling price cannot exceed 80% of the base price.

A copy of CPS-105 may be obtained on request from the Office of Price Stabilization, Washington, D.C. and parties buying or selling used equipment should study it to understand the terms used and to determine that prices quoted are not in violation of current regulations.



You *make* concrete block, but is that what you *sell?* Is that what the ultimate customer buys when he purchases your product to build a house, a store, office, garage or factory?

No. He buys walls. He judges you and your product on the basis of how it performs as a wall—after the units have been laid. That's why your reputation depends on how well those walls serve, how well satisfied the customer is.

The first requirement for quality walls, of course, is quality block. That means complying with ASTM and Federal specifications for moisture content, strength and water absorption.

Yet quality block alone will not assure walls that give good performances. Quality construction is necessary too. For that reason farsighted concrete masonry manufacturers recommend only those contractors who can be depended on for quality concrete masonry construction.

In addition they make frequent inspections of construction on jobs where their units are being used. They know that quality walls are the best salesmen for additional jobs, the best insurance for continued success and future business.

PORTLAND CEMENT ASSOCIATION

33 W. Grand Avenue, Chicago 10, Illinois

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

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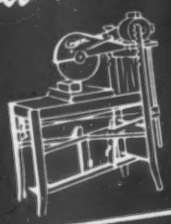
Now CLIPPER Gives You A NEW CONVERTIBLE MASONRY SAW!

Here's How . . .

FIRST YOU BUY A CLIPPER MASONRY SAW



and THEN YOU ADD . . . the "CONVERTIBLE" CART

THEN USE YOUR CLIPPER "4" WAYS

① Use as a DUSTLESS Masonry Saw
② Use as a DRY Masonry Saw

③ Slip the head from your Clipper Masonry Saw into the "CONVERTIBLE" CART and you have a Handy Concrete Saw.

④ Place it in tracks and you can cut large stone slabs or transite sheets

MODEL HD
9 models from $265

GREATER JOB PROFITS THAN EVER BEFORE!

. . . at any time the cutting head of your Model HD Clipper Masonry Saw can be placed on the "CONVERTIBLE" CART (that's all you do)—you're then ready to saw concrete or asphalt patches or trenches! Imagine...switching from cutting glazed tile, concrete, face brick to sewer, water or gas lines or floor patches. No more fractures beyond removal lines—no more spalling!

But there's more . . . just set the "CONVERTIBLE" CART on Tracks and operate as a TRACK SAW. Stone slabs, Transite sheets, Plywood, Masonite, Pre-Cast Stone and large Refractories can at last be easily cut.

Try This Combination on FREE TRIAL

Order TODAY . . . on FREE TRIAL. Discover for yourself how Clipper will increase production . . . cut costs . . . increase profits. Only through the Clipper FREE TRIAL ARE you guaranteed . . . ACTUAL TEST on the JOB . . . FULL SATISFACTION . . . NO OBLIGATION! . . . If you prefer, order your Clipper Masonry Saw now . . . and the Clipper "Convertible" Cart when the need arises.

SELECT-A-NOTCH
● One man easily adjusts Cutting Head to desired height . . . Whether cutting 12" or 1" material. Operator's hands merely guide. Weight supported by rear Bar.

PRESSURE EQUALIZER
● Makes your blades last longer . . . Because Equalizer Spring automatically cushions blade pressure whether cutting HARD or SOFT materials. Outstanding for blade economy.

ADJUST-A-CUT CONTROL
● Pull the knob—and the Cutting Head is free for finger-tip setting at any desired angle. Release the Knob—and Head is locked in the desired position.

SAVE-A-BLADE DIAL
● Just turn the Save-A-Blade Dial to the material hardness and the Pressure Equalizer Spring automatically sets the tension—guarantees faster cutting and longer blade life.

Clipper
KANSAS CITY 8, MISSOURI

"COAST-TO-COAST"

PITTSBURGH, ST. LOUIS, CLEVELAND, INDIANAPOLIS, DETROIT, HOUSTON, AUSTIN, TEX., CHICAGO, LOS ANGELES, PHILADELPHIA, SAN FRANCISCO, CINCINNATI, NEW YORK, ATLANTA, WASHINGTON, D. C., BOSTON, BIRMINGHAM, KANSAS CITY

GENUINE CLIPPER BLADES—ALL DIAMETERS

DRY-WET & B-R BLADES

DIAMOND BLADES

MAIL THE COUPON TODAY!

Serving the World as the World's Largest Manufacturer of Masonry Saws

CLIPPER MANUFACTURING COMPANY
2807 W. N. WARWICK, KANSAS CITY 8, MO.

Send FREE Information and Literature on:

☐ NEW CLIPPER MASONRY SAWS ☐ CLIPPER CONCRETE SAW
☐ DUSTLESS Model HD ☐ FREE TRIAL 89

NAME _____

ADDRESS _____

CITY _____ STATE _____

SOLD ONLY DIRECT FROM FACTORY

chem brick

A FACE BRICK OF HIGHEST QUALITY—

MADE WITH THE CHEAPEST MATERIALS KNOWN TO DATE

"CHEM BRICK" requires no cement or commercial lime . . . is made only with sand and waste materials.

Detroit Brick & Block Company, first licensee by Jackson & Church Company to manufacture "CHEM BRICK"

"CHEM BRICK" . . .

the sensational, new building material . . . passes the A.S.T.M. specifications for first quality face brick and the most exacting freezing and thawing tests . . . yet no ingredient costs more than $2 per ton, including binder.

PITTSBURGH TESTING LABORATORY

PITTSBURGH, PA.

April 23, 1949

REPORT
TESTS OF "CHEM" BRICK
MANUFACTURED BY
DETROIT BRICK & BLOCK CO.

COMPRESSION
(½ Brick Crushed Flat-wise)

NO. OF SAMPLES	LBS. PER SQ. INCH
5	Average 4910

MODULUS OF RUPTURE

NO. OF SAMPLES	TOT. LOAD LBS SQ IN.
5	Average 975

ABSORPTION
(24 Hour Immersion - ½ Brick)

NO. OF SAMPLES	PERCENT ABSORPTION
5	Average 11.4

All samples submitted by Detroit Brick & Block Co.

PITTSBURGH TESTING LABORATORY

MANAGER DETROIT DISTRICT

April 6, 1949

REPORT - FREEZING & THAWING

METHOD OF TEST - A.S.T.M. Designation: C7-44 covering Standard Methods of Sampling & Thawing Brick for a total of 51 cycles.

CONCLUSIONS - Test indicated compliance with specification requirements for freezing and thawing test.

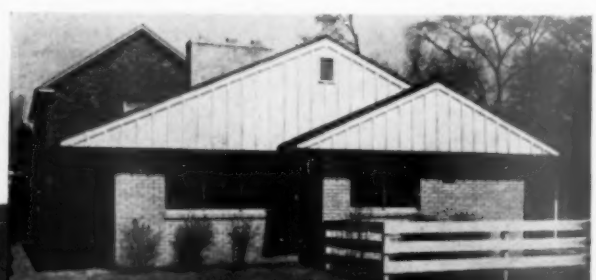
Respectfully submitted,
PITTSBURGH TESTING LABORATORY
Frank Lak
Cement & Concrete Section

A REAL HIGH QUALITY FACE BRICK WHICH CAN BE MADE CHEAPER THAN ANY COMMON BRICK ON THE MARKET TODAY

This quality product . . . made by the cheapest process in the brick industry is finding a ready market in the Detroit area where it has brought usually expensive brick veneering within the reach of average purses. In addition to its low cost other features are its distinctive finish, color and uniformity which give any building that "quality appearance" when used as a facing material.

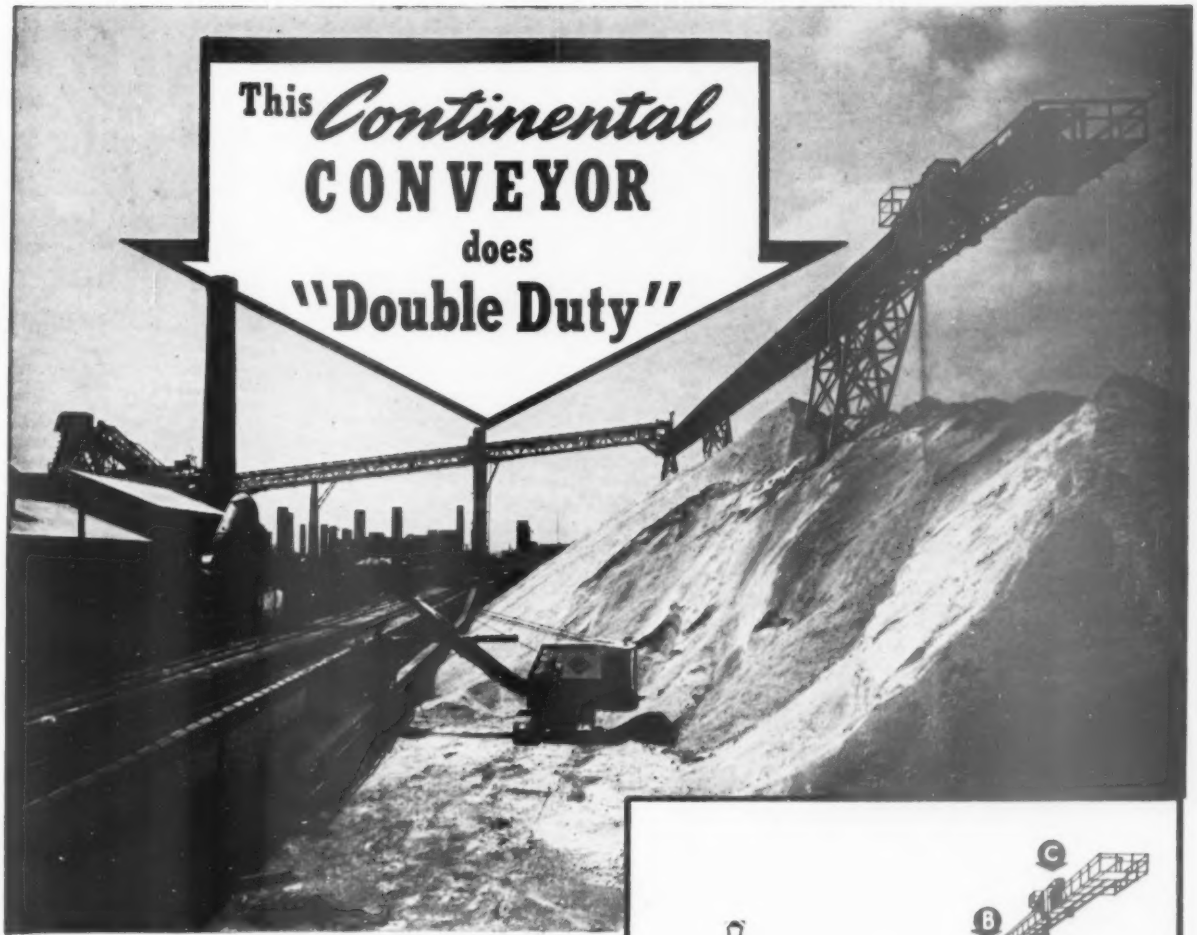
Besides being a fine face brick . . . "CHEM BRICK" is an all-purpose brick because of its low cost of manufacturing. Can be used anywhere brick is used . . . facing, back-ups, partitions, manholes, fire places, chimneys, basement walls, etc.

Boxed at left are excerpts from test reports on "CHEM BRICK" made by Pittsburgh Testing Laboratory. Note distinctive appearance of home pictured utilizing "CHEM BRICK" as facing material.



Typical new home construction using "CHEM BRICK" as face brick. Detroit, Michigan.

JACKSON & CHURCH COMPANY
SAGINAW, MICHIGAN

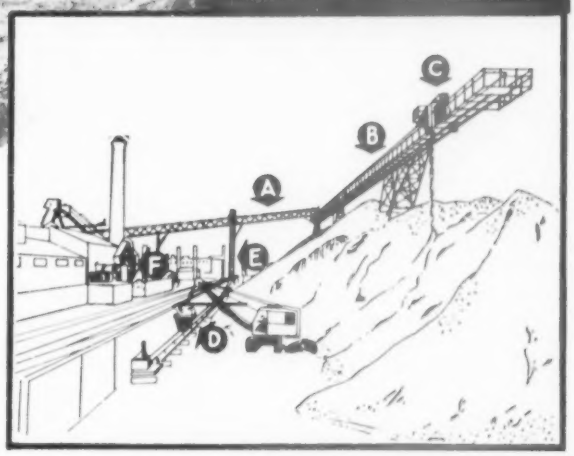


Another Example of Continental's Belt Conveyors at Work -

The Southern Cement Company's conveying and elevating system in their Birmingham Plant incorporates several advanced features of design—one of which is illustrated above and to the right.

Continental's engineers are skilled in "practical engineering" — the kind that results in installations designed for economical, dependable operation and long life. All Continental products — whether especially designed systems and equipment or standard equipment and accessories — show the value of practical engineering.

• *Call Continental engineers in on your job — or specify Continental on your next replacement order.*



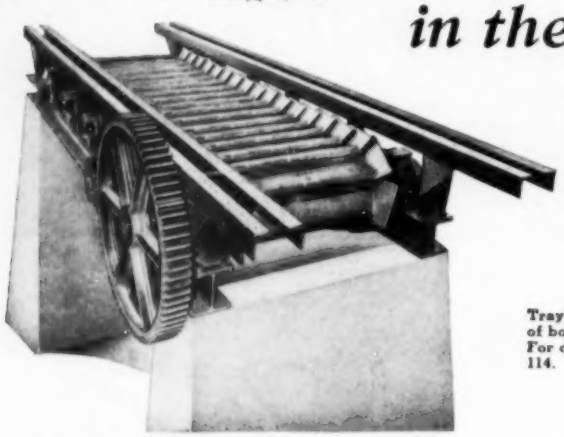
Slag is carried to storage by Conveyors A and B and discharged to storage at any point by self-propelled Tripper, C. As material is needed for processing, it is loaded by shovel onto Reclaim Conveyor D, raised by Bucket Elevator E, and discharged onto return side of Conveyor Belt A., which delivers it to Plant F.

Write for your copy of Continental's new Catalog ID 481, "Continental Belt Conveyors."

INDUSTRIAL DIVISION
CONTINENTAL GIN COMPANY
BIRMINGHAM, ALABAMA
ENGINEERS CGC ATLANTA • DALLAS • MEMPHIS • NEW YORK CGC MANUFACTURERS

in the good old days...

the "paved" road ended a few feet outside of town. At the whim of the weather, travelers "ate dust" or bogged down in axle-deep mud. Today, over 3 million miles of paved road leads us smoothly wherever we wish to go.



Traylor Apron Feeders will increase production of both primary and secondary crushers 50%. For complete details, ask for Traylor Bulletin 114.

AS OUR ROAD SYSTEM spread with the growth of our nation, the need grew for increased production of aggregate—foundation of the modern highway. For 50 years, Traylor has been a leader in providing the stone products industry with new and more efficient stone crushing machinery to keep pace with the need for increased production. Now, and in the future, you can rely on Traylor's growing fund of experience to provide the machinery that will help you do your job better.

Traylor

ENGINEERING & MANUFACTURING CO.

445 MILL ST., ALLENTOWN, PA.

Sales Offices: New York • Chicago • Los Angeles
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

A TRAYLOR LEADS TO GREATER PROFITS

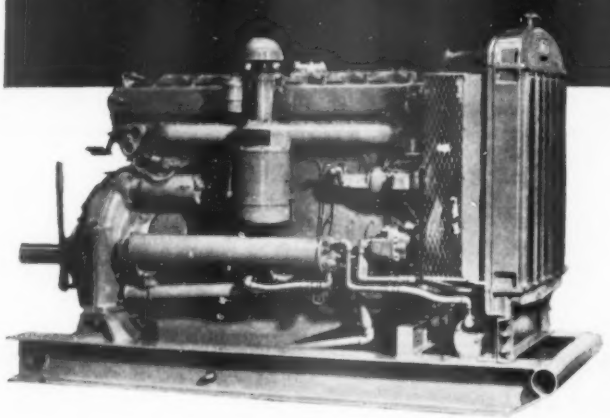
MURPHY DIESEL...

gives you easier starting . . .

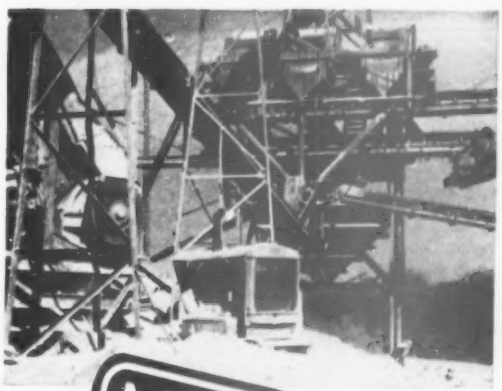
more economy . . . smoother

operation . . . better response

***because it has* UNIT FUEL INJECTION**



Cedarapids hammermill powered by a 150 H. P. Murphy Diesel in use at the Trego Quarries near Downington, Pa.



The performance of a diesel engine can be no better than the accuracy of control of fuel injection. That's why we say the unit injector is the heart of the Murphy Diesel. This simple, self-contained unit is both pump and nozzle. There are no high pressure fuel lines to interfere with smooth, accurate, precisely controlled fuel injection and rob you of power and fuel. In the Murphy Diesel, solid fuel completely atomized as a fine fog is injected directly into all parts of a plain, open combustion chamber. Ignition is accomplished solely by the heat of compression of the air within the cylinder. The precisely controlled rate of injection determines the speed and pressure of combustion, hence the power delivered and the amount of fuel used.

Translated into benefits for the user, Murphy Unit Fuel Injection makes possible greater power output with less fuel—better all around performance. Full details are given in the booklet *"10 Questions to Ask a Diesel Engine Salesman"*. Ask your Murphy Diesel Dealer for a copy or write direct.

MURPHY DIESEL COMPANY

5315 W. Burnham St., Milwaukee 14, Wisconsin

Sales, Parts and Service throughout the nation

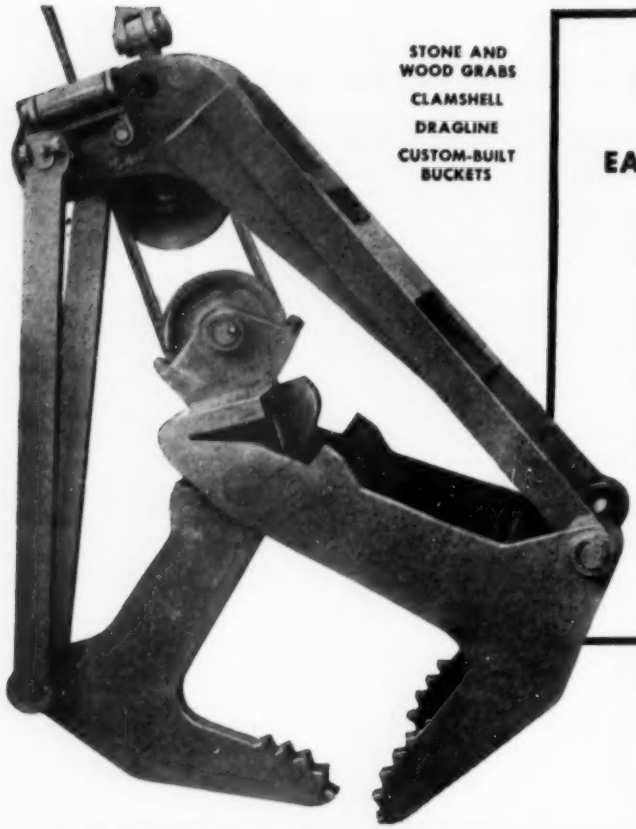
MURPHY DIESEL

218

Heavy duty power

for rock crushing

Murphy Diesel Engines and Power Units for portable or stationary crushing plants, 90 to 226 H. P. 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W.



STONE AND WOOD GRABS
CLAMSHELL
DRAGLINE
CUSTOM-BUILT BUCKETS

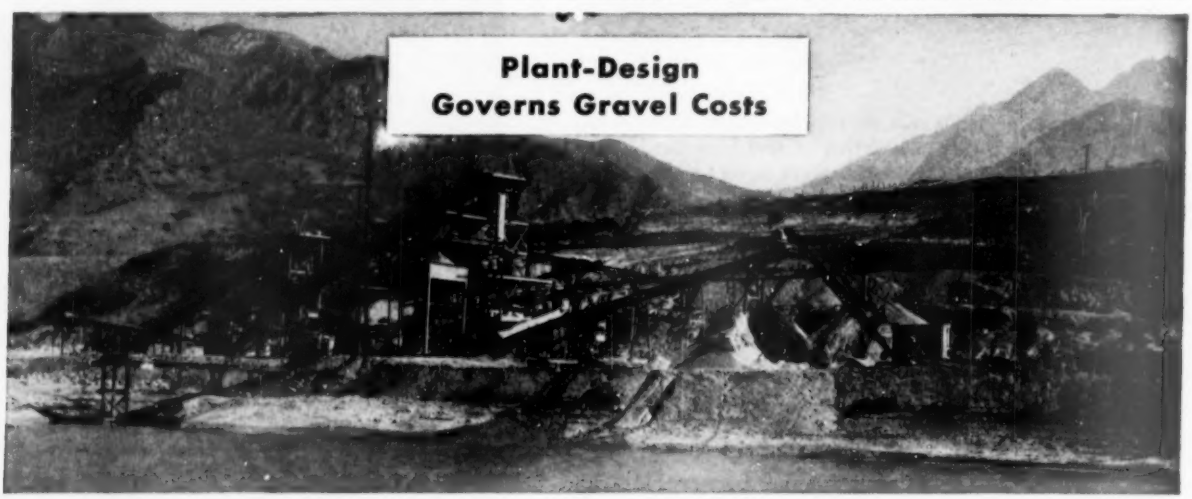
WELLMAN

EASY HANDLING OF LARGE STONES

● Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts? Send for free descriptive bulletins.

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio



In this S-A engineered system S-A Belt Conveyors were designed for the job of handling bulk materials at lowest cost per ton. Processing costs reached new lows. This installation has a capacity of 300 tons of minus 10" gravel per hour —or equivalent volume of other materials. S-A engineers are able to draw on fifty years experience in designing such installations for fast, economical handling of rock products for all types of plants—large or small. *Write today!*

UTAH SAND & GRAVEL PRODUCTS, INC.
BUTLERVILLE, UTAH

S-A belt conveyor equipment, screens and feeders are important elements in this plant's design. In addition to four sizes of gravel—two sizes of sand and 2½" road base material, are produced. S-A conveying and screening equipment is designed and built to give maximum life and service on this and similar installations.

1901-1951

50 years experience with bulk handling

STEPHEN S-A ADAMSON MFG. CO.

7 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. · Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

RUGGED A-C ENGINES

Cost less

-to own

—because they are *mass produced* along with engines by the thousands for tough tractor service. Users benefit from these savings, as well as interchangeability of parts and other advantages of mass production.

There are further savings in getting *exactly* the power needed. Any power requirement can be filled economically with the four sizes of A-C Power Units—15 to 74 b. hp. They can be used singly or two or more together.

Ability to develop torque quickly makes A-C Power Units ideal for crushing and other sudden overload jobs.

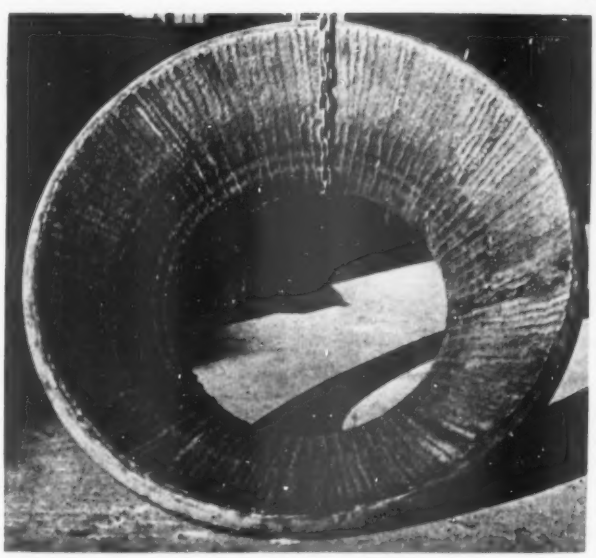
-to use

A-C Power Units run inexpensively on gasoline, low-grade fuel, natural gas or butane. Their "tractor service" stamina keeps them on the job during critical work periods—avoids loss of valuable time due to shutdowns, helps build product acceptance and good will. Service facilities are nation-wide.

Get all the facts on rugged, high-torque A-C Engines for dependable, *low-cost* power. Our power engineers will gladly help select the correct unit for your needs.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Resisto-Loy *cuts annual costs 50% of* Gyrasphere Liners



As the Gyrasphere type of Crusher is used in the secondary position and subjected to the extremes of real abrasion, the life of these liners is shorter than that of the slower motion Gyratory Crusher. Gyrasphere Liners are usually worn down as thin as possible, to get the most out of the castings. Due to their construction it is not practical to rebuild these thin liners as excessive distortion will result.

Gyrasphere Liners are another of those expensive manganese castings which can be made to last about 50% longer by a single application of RESISTO-LOY when brand NEW. Definite economies are realized not only in the savings of the manganese but in the "down-time," in labor costs of replacement and in "zincing" costs.

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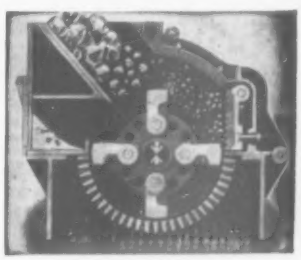

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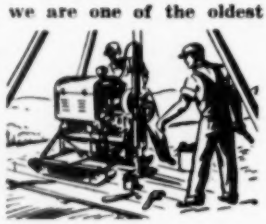

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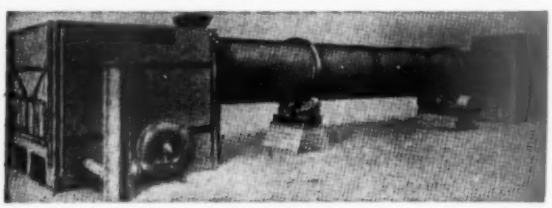

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6" x 3" to 60" x 48"

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12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
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Complete gravel washing plant.	Roller.
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1 Deister, 3x5, single deck screen with 3 HP air-cooled gasoline motor.
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Telephone—Syracuse 3-2228

FOR SALE

16" Telsmith Gyratory Breaker. Good condition; all bronze fitted.

QUALITY LIMESTONE PRODUCTS, INC.
P.O. Box 116
Waukesha, Wisconsin

FOR SALE——NEW

1—3 Deck Rotary Screen scrubber—approximately 9'x20'—Acme Iron Works, Manufacturer Top Deck —1¼" Gravel, Middle Deck ½ & ⅜ Outside Deck —to make sand & pebbles. Will furnish blueprint of screen to interested parties.
PRICE $6,400.00

F.O.B. Cars—Hoban, Texas

F. M. REEVES & SONS, INC.
Box 111 **Pecos, Texas**

FOR SALE

1 cu. yd. dragline bucket.
1—No. 6 Kennedy crusher.

ROME SAND, Inc. R.D. No. 3
ROME **NEW YORK**

CORE DRILLING
—anywhere!

"We look into the earth"
PENNSYLVANIA
DRILLING COMPANY
Pittsburgh 20, Pa.

PORTABLE CRUSHING PLANT: Pioneer 40-V, diesel powered, new 1949.
CRUSHERS, JAW: Sizes 12" x 15" to 48" x 60".
CRUSHERS, REDUCTION TYPE: Symons 2 ft. Cone, coarse bowl. Telsmith 13-B Gyratory, 12" opening, all steel, 50 H.P. motor.
DRYERS or KILNS: 2—10 ft. x 90 ft. heavy duty with or without auxiliary equipment, condition like NEW.
AIR SEPARATOR: Sturtevant 8 ft., extra heavy liners, new 1944, used six months, with steel supports.
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PULVERIZER: Hardinge 10 ft. dia. x 36" Conical Ball Mill, manganese lined, 300 H.P., 2200 volt motor, with all auxiliary equipment for dry grinding. Used 90 days.
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Crushed stone plant for sale

50,000 ton capacity.

Will sell going established business or will sell equipment in individual pieces.

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Quarry at Campbellsville, Ky.
Telephone 115

Link Belt Steam Locomotive Crane, s/n 706; 50' Boom; 40 H.P. Boiler; rated capacity 20 tons at 12'. In good working condition.

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Plymouth 35-ton gasoline locomotive, std. ga.
Crushers: 36x48, 24x36, 18x32, jaw; 16", 30" gyratory; Pioneer 305W, Lippmann grav. plants.
B-Erie H-3 Hydrocrane, 3-ton, I.H. truck.
Bulk cement bin, 400 bbl. Aggregate bins.
Euclid, Mack trucks, rear, 15, 22, 32-ton.
Shovels, Draglines, Cranes, 1¼ to 10-yd.
Whirley portal gantry cranes, elec. (4).
Orton 40-ton diesel locomotive crane.
Rotary dryers, kilns, 4x40, 7x72, 9x170, etc.
Walking draglines, 3, 5, 6, 7, 9 yds.
B-E 2¼-yd. shovel front attachment, 52B-55B.

H. Y SMITH CO 878 N. B'way Milw. 2, Wis.

QUARRY EQUIPMENT

3' Symons Short Head.
4024 Cedarapids Roll, Rebuilt.
Cedarapids Rockbit with 2025 jaw, 3033 mill, new.
Cedarapids 1236 Model 6C plant, new.
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10x7 Allis-Chalmers Blake type jaw crusher.
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4'x6' Kennedy Van Saun single deck.
4'x6' Kennedy Van Saun dbl. deck
3'x10' Cedarapids Symons screen.
16"x90' bucket elevator.
60-ton 2-compartment, 8'x18' storage bin with clamshell gates, New.
Magnetic Pulleys.

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Lorain L-50, 1-yd. diesel.
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WELL DRILLS AND TOOLS

Sanderson-Cyclone No. 42 well drill, new.
Sanderson-Cyclone No. 44 well drill, new.
Keystone Model 70.
Bits—Stems—Bailers—Sockets, Etc.

BELT CONVEYORS

18"—24"—30"—36"
Lattice or channel. "Sealed-for-life." Idlers

GENERATORS AND LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

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Ingersoll-Rand 105 on rubber. Waukesha gas.
Schramm 105 cu. ft., gas powered, on 4 steel wheels.
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Worthington 210, 2-stage, air-cooled, on steel wheels with Hercules diesel.
Pennsylvania 12"x10" class 3A single cyl., 355 cu. ft. flat belt drive, 50 H.P. slip ring motor.
Worthington 2-stage, water-cooled vertical 250 lb., 60 CFM, diesel starting compressor, new condition.
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Paving breakers, wagon drills, jackhammers and tie tampers.

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Phone **Harrisburg 7-3431**

1—10 Ton Link Belt YC-9 Cargo Crane.
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6—13-TD Euclid Rear Dump 22 Ton—1948.
1—Lorain MC 414 Truck Crane—1946.
1—TC70 Link Belt Truck Crane 40' B.
1—¾ Lorain 41 Comb. S&D 1948.
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1—6 Ton Huber 3W Roller.
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1—40 Ton Industrial Oil Fired Loco. Crane 1943.
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Special—Unused Morris 10" gravel pump with spare parts in original crates. Big discount.

Hanson truck crane	P&H 300 with new under carriage	Rogers 18x36 crusher
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3 yd. Dumpcrete	Erie 8" Nicro-Steel Sand pump	3300 lb. wrecking ball
Day No. 5 hammermill	New Pioneer 18"x100' conveyor	Climax TU engine

These machines reconditioned in our newly-built daylight plant. Come see them!

10030 Southwest Highway **TRACTOR & EQUIPMENT CO.** **Oak Lawn, Ill.**

"Hard to Find" Equipment

BUILDING
Steel, bolted frame, 27' wide, 56' long, 27' clearance bottom truss.

BUCKET ELEVATORS
70'6" centers, 8" x 5" buckets.
64'3" centers, 10" x 6" buckets.
60' centers, 8" x 6" buckets.
50'6" centers, 8" x 5" buckets.
44' centers, 10" x 6" buckets.
40' centers, 6" x 4" buckets.
38' centers, 10" x 6" buckets.
32' centers, 6" x 4" buckets.
23' centers, 8" x 5" buckets.

ELEVATOR EQUIPMENT
BUCKETS-Link-Belt MS 6"x4", 8"x5", 8"x6", Link-Belt MS 18x8x8½. (190-NEW).
CHAIN—Jeffrey H-82 (NEW).
Jeffrey H-88 (NEW).
Link-Belt 103 (NEW).
Saco A 509.
Link-Belt RC No. 60 and No. 120.
SPROCKETS — Steel & C.I. (Write for list).

CLASSIFIERS
Dorr, duplex, 4'x20'.
30"x15' Flight Separator.

BELT CONVEYORS (Troughing)
104' centers, 10" wide belt.
24' centers, 10" wide belt.
13' centers, 10" wide belt.
56' centers, 16" wide belt.
475' centers, 18" wide belt.
300' centers, 18" wide belt.
70' centers, 18" wide belt.
13' centers, 18" wide belt.
96' centers, 30" wide belt.
50' centers, 42" wide belt.

CRUSHERS
No. 3 Williams.
36"x24" Jeffrey A2.
40"x14" two-roll Traylor.
18"x36" Jaw, Traylor, Bulldog.
48" Symons vert. disc.

FANS AND BLOWERS
All sizes, from 1,000 to 75,000 CFM.

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Syntron, type F33, vibrating.
Jeffrey, 18"x36" vibrating.
Allis-Chalmers, 26"x12"x6" vibrating.
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8' x 12' Feinc, all steel.
8'x10' Oliver, steel and wood (3).
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4'x16'x⅜" shell, welded portable.
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10'x90'x9/16" Allis-Chalmers.
9'6"x8'6"x200'x¾".

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20" dia. 36" long Magnetic Eng. Co. type MP (NEW).

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Raymond, 4 roll.
5'x22' Smidth, Tube.
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6'x8' Abbe, style GPH, Pebble.
Stedman, four cage.
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16"x40", three roll.
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L.B. Pug 2' wide, 12' long, double shaft (2).
48" Symons vert. Disc Crusher.
PUMP—Fuller Kenyon 4".
SPEED REDUCERS — All sizes and ratios.
SCREEN — 4'x7' Tyler-Hummer.
STACKS — 422x37' high, 5/16" & ⅜".
40"x40'x¼", welded.

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8,500 gal. 9'x23'x5/16" (NEW).
4,100 gal. Vert. 5'x28'x¼" (NEW).
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1,600 gal. 8'x7'x3/16" (2).
1,100 gal. 5'x7'x¼".

TANK CAR TANKS
6500 gal. 76"x2'10" (30).

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Machinery & Equipment Merchants

Symons 42"x14' 1¼ deck vibrating screen.
Traylor double deck Vibrator screen, 41" x66".
Universal vibrating screens, single and double deck.
Two Selectro enclosed vibrating single deck screens, 4'x6'.
Selectro single deck 18"x60" vibrating screen.
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Deister "Plat-O" 3 deck 3'x6' vibrating screen.
Simplicity single deck 6'x8' scalping screen.
Double roll crusher 28"x18" face.
Buchanan B Jaw crusher 10"x16".
Reliance jaw crusher 14"x24".
Kent Mill pulverizer, type G.
New manganese jaw plates 65"x42", 39" x30", 28"x25". Toggles and bearings for Farrel 13"x24".
Portable belt conveyors 24"x25', 14"x24', 24"x175' belt conveyor, Stearns idlers.
Good used 24" belt in long lengths.
42"x150' conveyor equipment.
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Gravity roller conveyor, 8" to 20" wide.
Vibrating feeders and vibrators.
2 Sturtevant Exhausters, size 8½, design J.
Bin gates, duplex, 15x15 and 20"x20".
Reducers, horizontal, vertical and variable.
Standard chain for elevators, drive and drag.
Bucket elevators, chain or belt, buckets from 4" to 20".
Belt elevator with 8" continuous buckets 55'.
1500 ft. of 126 C roller chain DI, RH and LH.
Pumps, motors, engines, gears and sprockets.
300 assorted V drive pulleys.
Storage tank 4'x17' of ½" plate.

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Surplus Quarry Equipment

1—No. 25 Kennedy Crusher, late type with split grinding ring, new type oiling system and V-Belt drive with motor—Good Condition.
1—Champion 10x30 Ball Bearing Overhead eccentric Jaw Crusher and drive—Good Condition—(Factory rebuilt in 1949).
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67", 8 ply—18" wide transmission belt—Like New.
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Immediate delivery 1 P&H Model 1400 Electric Stripping Shovel, guaranteed condition, 48 ft. boom, 34 ft. sticks, 3¾ yd. bucket, large inventory of parts.

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Le Roi Model 210-G
Air Compressor

This machine has never been used. The new current price is approximately $5500 but we have priced this one at:

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(Subject to prior sale)

CONTINENTAL 112 horsepower gas engine, almost new—price $1,000.00.

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TELSMITH 36" Gyrasphere Crusher, Serial No. 6148, in good working condition, with following additional spare parts, Main Shaft, 2 Lower Mantles, Upper Mantle Sphere Head. Mantle Nut, Stud, Stud Cap, etc. Replaced with larger crusher. Requires 75 HP Motor to operate.

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PORTABLE CRUSHING PLANT BARGAIN

UNIVERSAL 293Q Twindual PACEMAKER 3 stage Portable Crushing & Screening Plant. 18x24 r.b. Primary Jaw, Apron Feeder, Twin Dual rolls, 2½ deck Vibr. Screen, Conveyors, mounted tandem pneumatic tires. New 1948 cost then $36,500.00 Excellent condition $17,500.00.

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A Byers crane, Model 83, Serial No. 1430. Powered by Caterpillar D 318 motor, serial No. SV5098, equipped with electric starter. Motor completely overhauled by factory representative. 50 ft., boom, ¾ yd., clam and drag on 14 ft., 30 inch pads.

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FOR SALE

5—Autocar Model DC100 Dump trucks, Powered with Cummins HBD600 engines 12.00x20 on front 14.00x24 duals on rear. 12 cyds rock beds.
2—100 hp. HRT Boilers, 1—50 hp. vertical new tubes.
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4—Single drum mine hoists with electric motors.
Centrifugal pumps, 2", 4", 6", motor driven.
Electric motors 1 hp. to 100 hp.
1000' 8" used pipe.
1—36"x105' Linkbelt pan conveyor.
1—24"x77" continuous bucket elevator.
All equipment in good operating condition.

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Steel rock bin, 100 tons, 3 compartments with gates, 20 ft. long, 13 ft. wide, 30 ft. 6" high. Never been used. $3000.00 f.o.b. cars or truck.

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Stearn's 12 ft. mixer with or without 10 h.p. motor. 220 three phase. Scoop for Hyster 20.
Would trade above for powered platform truck.

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Allis-Chalmers. H D No. 7. Garwood Blade. All for $4,000.00. This tractor is in excellent condition, looks and runs like new. Ready to go to hard work.

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New 1951 LFSW, 165 H.P. Mack Diesel Dump Truck with power divider tandem, 1100x20 tires, Penn Twin Telescopic 20 yard dump bed, at our cost of $15,850.00. Also one 25'x18" self propelled Conveyor with new belt and motor $1,000.00, used.

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FOR SALE

One Fairbanks-Morse diesel engine, Type Y, Style VA, 180 HP.

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Wisconsin 6 cylinder gas motor Model D-12, Serial No. 1129. This motor has been used to power Koehring One Yard Shovel. Excellent condition. Price $1200. F.O.B., Melrose Park, Illinois. Write Fox River Stone Company, Rt. 2, Elgin, Ill.

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250 cu. ft. Jaeger Air Compressor, on skids, gas engine. used only four months. 118 cu. ft. Gardner-Denver Air Compressor, 25 h.p. electric motor driven.

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3-inch Wilfley Pump in good condition. Send complete details.

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WANTED

8 Inch belted design, either standard or counter flow, Amsco dredge pump. Specify condition and price.

J. F. FOSTER, LAWRENCEVILLE, ILL.

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1—Raymond 3 Roll High Side Mill, oil journals, whizzer, fan, cyclone, piping, tubular collector.

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2—Keeler 125HP Water Tube Boilers, ASME, 160 lb. pressure, with stokers.

3—6'x8' Patterson and Abbe Ball and Pebble Mills.

1—5'x22' Tube Mill.

3—7'x60', 5'x67', 4'6"x40' Rotary Dryers.

1—Steel Bin 15'x25'x9' deep, 6' cone —4 chute, with structural supports.

6—Tyler Hummer 4'x7', 3"x5' Single and Multiple Deck Screens.

12—Bucket Elevators 34' to 90' centers, 8"x5" to 24"x8" buckets, steel encased.

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Bulk Cement Storage Equipment, C. S. Johnson, complete with bucket elevator and screw conveyors, 2 steel 1000 bbl. capacity tanks, 1—100 bbl. weigh batcher tank purchased new spring 1950, also misc. crushing, grinding, hydrating and screw conveyor equipment for lime manufacturing and 15 gondola railroad cars.

ROCK CRUSHING OPERATION AND EQUIPMENT

Crusher and Quarry Equipment, Cedar Rapids jaw crusher No. 2540 with 24" wide conveyor system, Dixie hammermill with 150 HP electric motor, air compressor, wagon drill, Marion power shovel, loading hopper, 4 used trucks, electrical power system, stiff leg and boiler for sale outright. For lease, railroad siding for loading. Above all located on quarry site, Write Carney Company, Inc., Mankato, Minnesota, for complete details and price.

1—Kent Maxecon, Type No. 7 Ring Roll Mill and Drive.

1—No. 4½ Champion Jaw Crusher, 10"x20".

1—No. 6 Champion Jaw Crusher, 12"x 26", rebuilt.

1—New Holland Swing Hammer Pulverizer, 20"x10".

1—Acme Deep Frame Jaw Crusher, 24" x40".

1—18" Link-Belt Apron Conveyor—9" pitch, 27' centers.

Bucket Elevators, open and totally enclosed, new and used, as is or rebuilt.

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FOR SALE

TWO WILLIAMS "4 Roller Mills," High Side, Spinner Separators, Motors, complete. Used four months. By original owners. Immediate delivery.

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EQUIPMENT FOR SALE
FOR 35 YEARS
SAME ADDRESS
SAME NAME

PULVERIZERS:
1—5 roll Raymond High Side, No. 5057, complete with separator exhauster, cyclone, tubular, inter-connecting piping.
1—4 roll Williams "Comet" with separator, motors and all equipment.
1—4 roll Williams "Standard."
6—No. 1, 0, 00, 000 Raymond.
2—No. 00 and 8" Raymond Screen Mills.

HAMMER MILLS:
1—30"x12" Williams, roller bearings, with motor.
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2—Type MT Jeffrey Crushers, each with 125 H.P. motor.
2—Jeffrey Mills, 36x24" and 36x42" Type E.

BELT CONVEYORS:
2—42" Robins, complete with head and belt pulleys, gear reducers, etc. Complete with all idlers, etc.
162—42" Robins Troughing Idlers, Style 253 XR, Timken bearings.
46—Robins Return Idlers. Style S-350, Timken bearings.
12—Steel supporting Belt Conveyors from 18 to 36" wide, various lengths, including motor drives.

CRUSHING ROLLS:
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1—24"x15" Sturtevant Balanced type.
1—24"x32" Penna. Single Roll with motor.
1—24"x36" McLanahan single roll.

ROTARY DRYERS:
1—3'x24' All MONEL, with all auxiliaries.
1—5'x24' Coatesville, ½" shell.
2—5'x40' Ruggles Coles.
4—4x30', 5x30', 6x40', 6x60'.
1—6'x50' Louisville Rotary Steam Tube Dryer.
1—6'x27' Louisville, with 42 stainless steel tubes.
1—7'x70' Louisville, direct heat.

VIBRATING SCREENS:
3—"Jigger" 3'x6' 2-deck, one 3'x6' 1 deck all totally enclosed, heavy duty.
1—3'x6' Colorado Iron Works, 1 deck.
1—4'x8' Tyler Niagara, 3 decks.
8—Tyler Hummer Screens, 3x5', 4x5', 4x10'.
4—No. 71 J. H. Day Co. "Robuilt," 1 deck, ALL STAINLESS STEEL.

VACUUM FILTERS:
1—8'x12' Feinc ALL STAINLESS STEEL.
1—8'x12' Oliver acid proof, wood and lead.
2—4'x4' Oliver, all bronze, top feed salt type.
2—8'x12' Oliver, all steel.
1—5'4"x6' Oliver, all steel.
1—American 6' dia. 2 disc, complete, 100 sq. ft. F. A.

BRIQUETTE PRESS:
1—36"x24" Komarek-Greaves, two roll.

SIMPSON MIXERS:
18", No. 2—6', No. 3—8'.
Also Shovels, Cranes, draglines; Jaw, Gyratory and other crushers; Symons and Telsmith Cones; Complete Portable Crushing Plants; Rotary Kilns and Coolers; Air Compressors; Conveyors; etc.

CONSOLIDATED PRODUCTS COMPANY, INC.

15-16-17 Park Row, New York 38, N.Y.
BArclay 7-0600

Special Crushers ! !

Symons 5½ ft. Std. cone crusher.
Cedar Rapids 4x53 Hammermill, Diesel powered.
ALLIS-CHALMERS 60" x 84" Jaw Crusher.
A-C Superior McCully 36" Gyratory with drive.
FARREL BACON 36" x 48" Jaw Crusher.
BUCHANAN Type C 36" x 42" Jaw Crusher.

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Northwest 80-D Diesel Shovel 2½ yd. Recond.
Northwest No. 6 1½ yd. Diesel Shovel.
Link Belt K-580 Shovel. 1948—practically new.
Lorain L-820 Dragline 70 ft. boom.
P&H Model 855, 2 yd. Diesel Shovel.
LIMA Model 34 yd. Dragline 34' Boom. Diesel.
Lima 1201, 2½ yd. Diesel Shovel.
Lorain L86 Shovel, 1⅝ yd. complete overhaul.
Link Belt K-505 dragline, 2½ yd., 8 ft. boom.
Koehring 605, 1½ cu. yd. Shovel—Diesel.
Lima 802, Shovel-Crane-Drag. 2 yd. Diesel.
Koehring ⅝ yd. Diesel Shovel.

CRUSHERS

JAW: Acme 10x36, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 20x36.
Cedar Rapids 10x20, 20x36, 25x40, Farrell 10x20, 13x30, 14x36, 18x36, 36x48. Buchanan 36x42.
Good Roads Reliance 15x36. Traylor 18x36, 21x36.
Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Champion 1630, 1640, 1236, 1530.

GYRATORY: Allis-Chalmers-McCully, 6", 7½", 8", 9", 12K, 20", 30", 42", 54", Newhouse, 24", 30". Gyrasphere, 10", 28". Traverse Telsmith, Telsmith 5H, 10-B, 13-B, 16-B. Kennedy Van Saun 7, 15, 35½-6, 37. Traylor Ty 1'6", Ty 2'6", T-4½".

ROLL: Allis-Chalmers 54x24, Diamond 40x22, Pioneer 30x18. Telsmith 24x16. McLanahan & Stone 18x42; 24"x18". New Holland 24x16.

HAMMERMILL: Size 4 Williams Jumbo, Pennsylvania 8X2, 22x22. Cedar Rapids 20x28. Jeffrey 36x42. Jeffrey 36x24, 36x40. Dixie 3650.

BALL MILL: Allis-Chalmers 4'x4', 5'8"x18'. Kennedy Van Saun 7'x5'. New 4'x4'; Hardinge 6'x4'; Colorado Iron Works 5'x6'; Marcy No. 64½.

ROD MILL: March 3'x6', 3'x8'. Allis-Chalmers 4'x8'. Hardinge No. H 206.

CONE: Symons 2' coarse bowl, 3' short head, 4' standard coarse bowl.

TUBE MILL: Smith 16B 5'6"x30', Denver 3'x8'.

DRIERS: McNeil 5'x50', Hardinge 90"x60'. Cummer 66"x50', Perkins 8'x70', 10'x90'.

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Symons 4' x 10' 3 deck.
Diester 4' x 16' 3 deck.
Tyler Hummer 3' x 5' with motor generator.
Acme 5' x 12' Revolv. Scrub-Scalp Screen.
Pioneer 4' x 10' Scalping Screen, New 1946.
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Hough HE Payloader with 13 ft. bucket. Excellent.
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5 Sterling 340 Rear Dump Trucks 22 yd. Diesel.
8 Euclid Model 25 FTD Bottom Dump.

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Sauerman sinck line 1¼ yd.; electric 90' mast.
Sauerman 3 yd. cableway with 125 HP electric.
Sauerman 1½ yd. 70' mast, 150 HP Elec. Hoist.
Sauerman 1 yd. with Waukesha gas hoist.

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3—Cat. D8 Ser. 2U with bulldozer DDPCU.
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Int. TD 9 ⅝ yd. bucket loader and 8' bulldozer.

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Johnson 4 compt. 300 ton agg. 1 compt. cement, 492 bbl. reserve cement silo.
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Hetherington-Berner heavy duty Moto-Paver.

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Iowa Model 2A Crushing and Screening plant.
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Telsmith Primary Port. 25"x36" jaw crusher Diesel.
Pioneer Secondary Plant. Port. 100 T.P.H. 1¾".

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Cement plant — located in very desirable section of the country. Send resume of qualifications and experience. Applications reviewed in confidence. Reply to BOX K-38, ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois.

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Complete attachment for a Besser Machine an 8x8x18 and a 6x8x18 header block attachment. Write—

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WANTED

Mill superintendent. Man familiar with operation of crushers, screens, elevators, conveyors. Location, central Virginia. Age desired, 30 to 45. If interested give full details regarding self. BOX K-29, ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois.

WANTED

CEMENT PLANT WORKS MANAGER for location in the Southwestern United States. Must have working knowledge of production, engineering and possess executive ability. State age, experience, references and salary expected. Write Box No. K-27 c/o ROCK PRODUCTS, 309 W. Jackson Blvd., Chicago 6, Illinois

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Want man furnish drill and contract drilling and dynamiting in limestone quarry (tunnel operation). Or, will make profit sharing arrangement, or contract entire production. J. Wesley Gardner, Dayton Coal and Iron Corp., Dayton, Tenn.

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SIZES 60"x48" to 10"x7"

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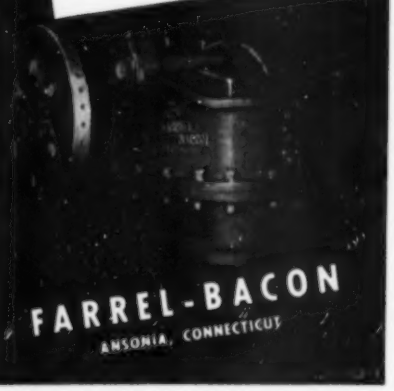

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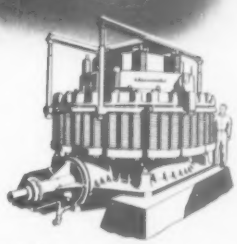

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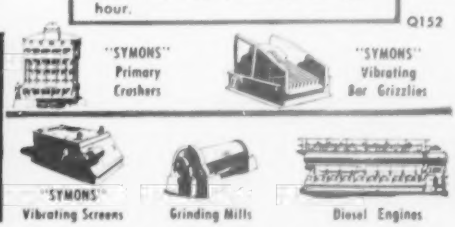

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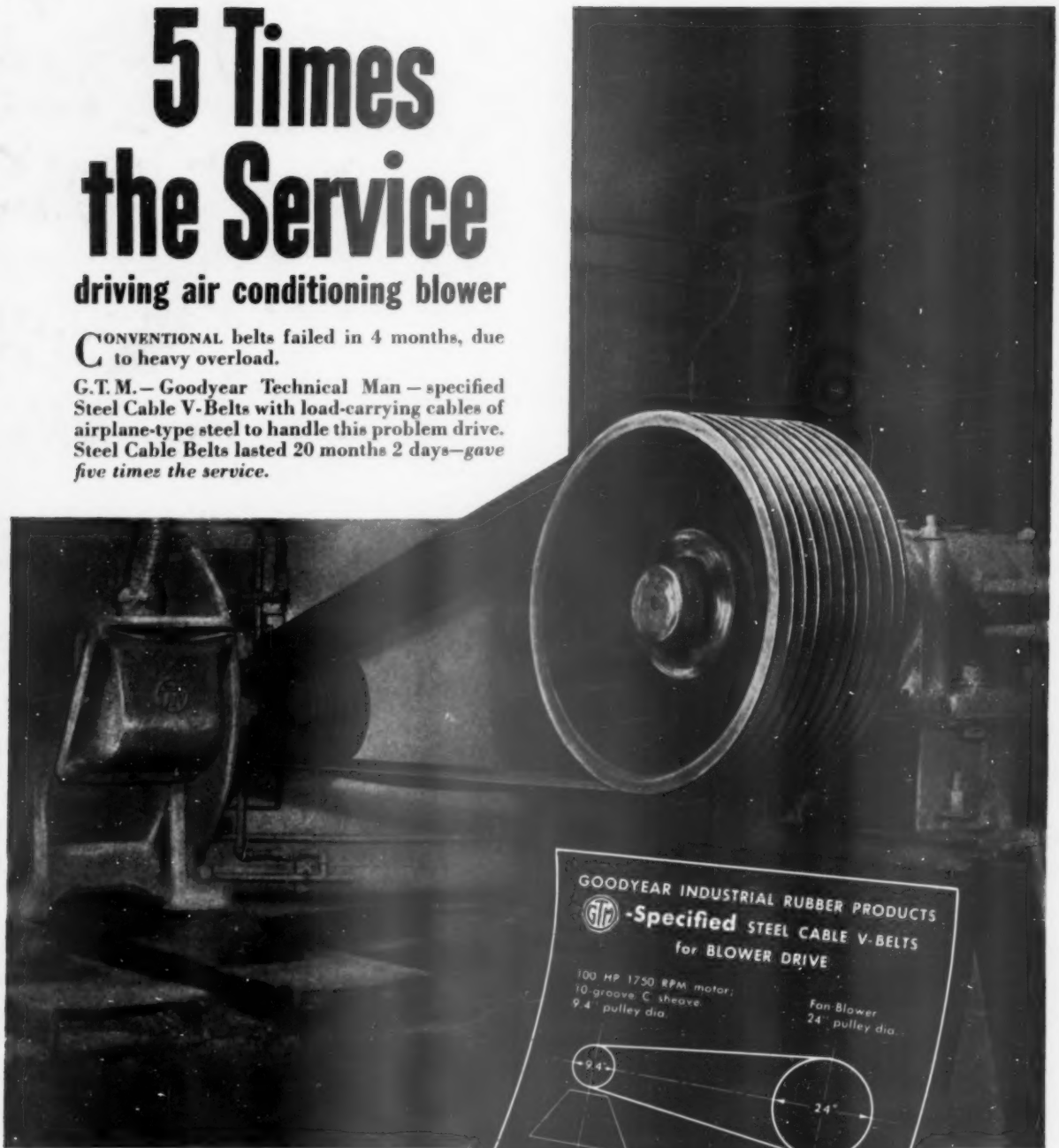

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Septic Tank Producers Meet

ILLINOIS PRECAST CONCRETE Septic Tank Manufacturers' Association recently held its fourth annual statewide meeting at Springfield, Ill. The two-day convention featured a banquet and a discussion of sanitation and installation problems.

Among those appearing on the program were James B. Coulter, senior assistant engineer, U. S. Public Health Service, Cincinnati, Ohio, who discussed research studies on household sewage disposal systems; William E. Budd and Otto Halden, State Department of Public Health, Springfield, Ill.; and Eugene Mittelberg, field representative for the Illinois Retail Plumbers Association, Mt. Sterling, Ill., who discussed the 1951 Illinois plumbing licensing act.

LeRoy Klueter, Edwardsville, Ill., was elected president of the association for the 1952 term, succeeding J. E. Sheley, Moline, Ill. Other officers elected were Bernard Abel, Pekin, Ill., vice-president; and Robert Humphrey, Aurora, Ill., secretary-treasurer. John H. Campbell, Kankakee, Ill., and Francis Ryan, Seneca, Ill., were named directors.

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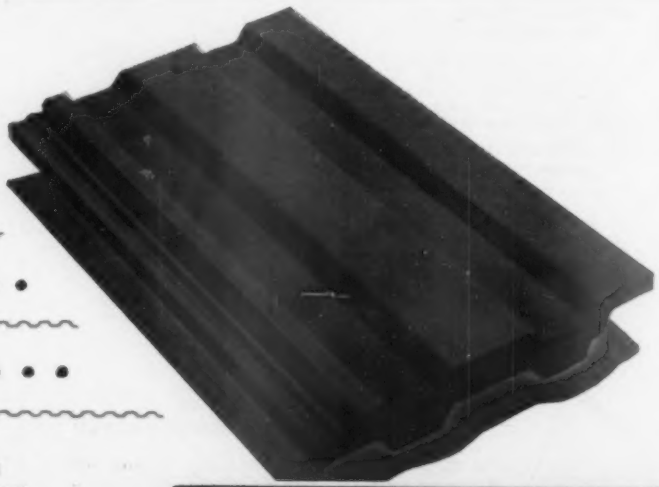

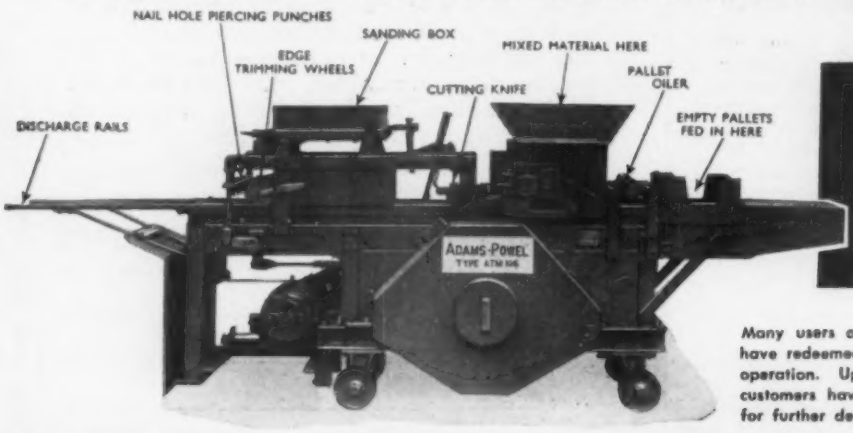

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